


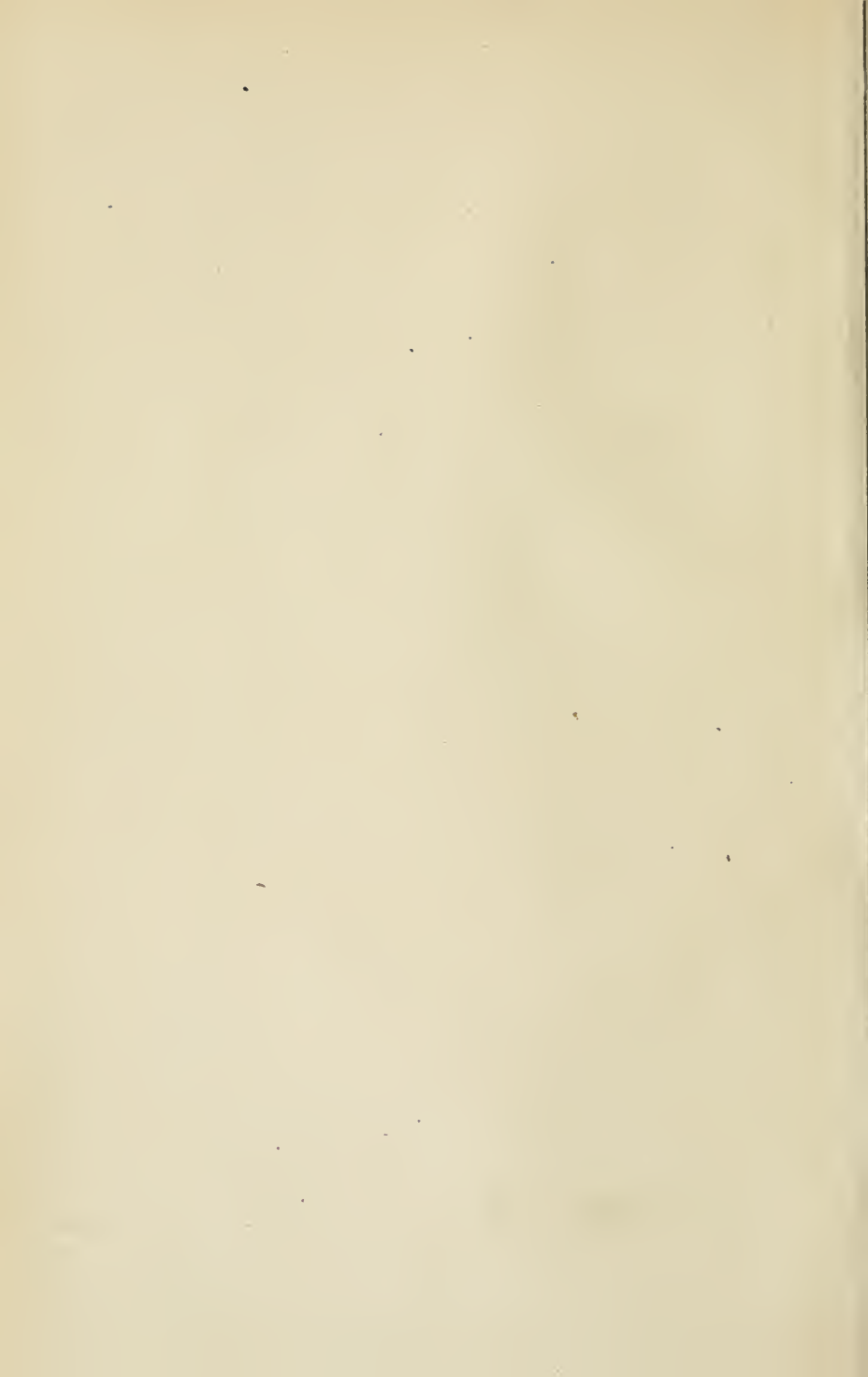
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Grevillea,

A QUARTERLY RECORD OF

CRYPTOGAMIC BOTANY

AND ITS LITERATURE.

EDITED BY M. C. COOKE, M.A., A.L.S.,

*Author of "Handbook of British Fungi," "Fungi, their uses," &c.,
"Rust, Smut, Mildew, and Mould," &c., &c.*

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Grevillea,

A QUARTERLY RECORD OF CRYPTOGAMIC BOTANY
AND ITS LITERATURE.

CALIFORNIAN FUNGI.

(Collected by Dr. W. HARKNESS. Determined by M. C. COOKE.)

Polyporus (Placodermei) obvolutus. Berk. & Cke. — Scarcely exceeding an inch in diameter, and two-thirds as thick.

On *Pinus contortus*. Harkness. No. 1004.

Polyporus (Placodermei) carneus. Ness.—On fir. Harkness. No. 915.

Polyporus (Anodermei) labyrinthicus. Schn.—On decaying *Pinus contorta*. Sierra Nevada, 7000-8000 feet. Harkness. No. 1012.

Polyporus (Inodermei) versicolor. Fr.—On oak. Sierra Nevada. Harkness. No. 980.

Polyporus (Resupinatus) argillaceus. Cooke.—Totus resupinatus, e mycelio tenui albo oriundus; margine albo; hymenio argillaceo; poris angulatis, inæqualibus, elongatis, laceratis; sporis globosis, .008 mm.

On rotting oak, and *Pinus Lambertiana*. Sierra Nevada, 2500 feet. Harkness. Nos. 958, 1000.

Polyporus (Resupinatus) ferruginosus. Fr.—On wood. Sierra Nevada. Harkness. No. 901.

No. 984, *Ozonium aureum* is probably a mycelial condition of some *Polyporus*.

Hydnum chlorinum. Cooke.—Totum resupinatum, ceraceum, chlorinum, aculeis, inæqualibus; elongatisve, acutis, apicibus pal-
lidis, hinc illic confertis. (*H. udum* affine.),

On maple. Sierra Nevada, 2500 feet. Nos. 974, 955.

Solenia candida. Fr.—On wood of fir. Sierra Nevada, 2500 feet. No. 917.

Merulius confuens. Schn.—On decaying spruce. Harkness. No. 1010. Sierra Nevada, 8000 feet.

Corticium carneum. Berk. & Cooke.—Effusum, membranaceum, ochraceo-carneum, albitu albo-fibrillosum; hymenio tenui, subcarneo, glabro, lævi, siccitate rimoso.

On *Pinus contorta*. Nos. 1016, 1025.

Corticium comedens. *Fr.*—On *Oreodaphne Californica*, 2500 feet. Sierra Nevada. No. 965.

Stereum evolvens. *Fr.*—On branches of *Prunus*. No. 766.

Stereum hirsutum. *Fr.*—On cedar logs. No. 1040.

Stereum purpureum. *Fr.*—On *Sambucus*. Sierra Nevada. Harkness. No. 938. Young state.

Hymenochaete rubiginosa. *Fr.*—On oak bark. Sierra Nevada. Harkness. No. 907.

Corticium sambuci. *Fr.*—On *Sambucus*. Sierra Nevada. Harkness. No. 937.

Corticium incarnatum. *Fr.*—On *Cornus*. Harkness. Nos. 987, 988.

Corticium scutellare. *B. & C.*—On dead shrubs. Sierra Nevada, 2500 feet. Harkness. No. 977.

Corticium calceum. *Fr.*—On branches. Sierra Nevada. Harkness. No. 903.

Grandinia ocellata. *Fr.*—On *Arbutus Menziessi*. Sierra Nevada. Harkness. Nos. 899, 902.

Clavaria abietina.—Under firs. Sierra Nevada. No. 913.

Hirneola auricula Judæ. *Fr.*—An abnormal form, without fruit, but probably developed in the form of *Peziza acetabulum*, by pressure during growth.

On fir logs. Sierra Nevada. No. 1006.

Dacrymyces deliquescens. *Fr.*—On pine wood. Sierra Nevada. No. 1037.

Lycogala epidendrum. *Burb.*—On wood. Sierra Nevada. Nos. 905, 912.

Cryptosporium lupini. *Cke.*—Sparsum, tectum, minutum; sporis lunatis, utrinque acutis, continuis, hyalinis, $.03 \times .004$ mm.

On stems of *Lupinus*. No. 1033.

No. 1009 on willow, is apparently an immature *Phoma*.

Macroplodia sambucina. *C.*—Gregaria, atra, erumpens. Peritheciis submembranaceis, papillatis; sporis subglobosis, brunneis, $.01 \times .008$ mm.

On *Sambucus*. Sierra Nevada, 8000 feet. No. 1011.

Excipula strigosa. *Fr.*—Probably this species, but no spores seen.

On *Sambucus*. Sierra Nevada. No. 940.

Nemaspora crocea. *Fr.*—On bark. Sierra Nevada. No. 916.

Ceratium hydnoides. *A. & S.*—On rotten oak. Sierra Nevada. No. 928.

Cytispora leucosperma. *Fr.*—On *Prunus Virginiana*. Sierra Nevada, 8000 feet. No. 1027.

Cytispora salicis. *Rabh.*—On *Salix*. Sierra Nevada, 8000 feet. No. 1023.

Uromyces intricata. *Cooke.*—Epiphylla, soris compactis, convexis, purpureo-brunneis; sporis ovatis, $\cdot 035 \times \cdot 025$ mm., glabris, late-brunneis; pedicellis elongatis, hyalinis, $\cdot 0\text{--}1$ mm. long, intertextis, infra attenuatis.

On leaves, peduncles, and stems of *Gayophytum ramosissimum*, No. 726.

Uromyces lupini. *B. & C.*—On *Lupin*. No. 740.

Puccinia striata. *Cooke.*—Epiphylla. Soris bullatis, pulverulentis, ovatis, purpureo-brunneis; sporis biglobosis, constrictis, asperulis, verrucis in lineas parallelas dispositis; pedicellis subobsoletis.

On aquatic plant unknown. No. 732.

Puccinia hieracii. *Mart.*—On *Crepis glaucus*. No. 724.

Hysterium formosum. *C.*—Sparsum, elevatum, ellipticum, opacum, leniter striatum; ascis cylindraceis; sporidiis uniserialibus, ellipticis, ad medio constrictis, triseptatis, cellulis divisis, brunneis, $\cdot 023\text{--}025 \times \cdot 012$ mm.

On *Pinus contorta*. Sierra Nevada, 8000 feet. No. 1020.

On *Juniperus occidentalis*. No. 1028.

Hysterium (Hypoderma) commune. *Fr.*—On herbaceous stems. Sierra Nevada. No. 1031.

Hysterium (Lophodermium) pinastri. *Schrad.*—On leaves of *Pinus contorta*. Sierra Nevada. No. 1024.

Hysterium foliicolum. *Fr.*—On leaves of *Quercus vaccinifolius*, Sierra Nevada. No. 1036.

Peziza (Dasyscypha) obscura. *C.*—Sessilis, sparsa, atro-fuliginosa; cupula pubescens, demum applanata, margine elevato, disco aquoso-cinereo, $\frac{1}{2}\text{--}1$ mm.; ascis cylindraceis; sporidiis linearibus, $\cdot 01$ mm.; paraphysibus filiformibus.

On twigs of *Quercus*. Sierra Nevada. No. 1034.

Peziza (Dasyscypha) epixantha. *C.*—Stipitata, brunnea, extus floccosa; cupula cyathiforma, 1 mm., disco pallidiore; ascis cylindraceis; sporidiis linearibus, $\cdot 01$ mm.; paraphysibus fusiformibus, utrinque acutis.

On twigs of *Quercus*, with the foregoing. No. 1034.

The external brown septate hairs are pale at the tips, crowned with a deciduous, subglobose, rough hyaline cell, as in *P. echinulata*, &c.

Peziza, immature, with the asci just formed, on cones of *Pinus contorta*. No. 1013.

These species of *Peziza* are accompanied by an anomalous kind of *Diplodia*, to which the name of *Diplodia anomala* is applied provisionally, as further specimens must be examined before it can be described satisfactorily.

Peziza hyalina. *P.*—On *Pinus contorta*. Sierra Nevada, 8000 feet. No. 1017.

Stictis radiata. *Fr.*—On oak twigs. Sierra Nevada. No. 921.

Patellaria abietina. *Cooke.*—Sparsa, atra. Cupulis orbiculis, applanatis, $\frac{4}{10}$ – $\frac{6}{10}$ mm., margine vix elevatis; ascis clavatis; sporidiis fusoides, hyalinis, $\cdot 01 \times \cdot 002$ mm., paraphysibus supra brunneis, connatis, gelatina hymenea olivaceo.

On decorticated *Abies Douglussi*. No. 763.

Cenangium leptospermum. *B. & C.*—On *Abies Douglassi*. No. 764.

Hypoxylon stigmatum. *Cooke.*—Effusum, nigrum, inerustans, ex ostiis prominulis papillosum; ascis linearibus; sporidiis lanceolatis, brunneis, $\cdot 028 \times \cdot 008$ mm., rectis vel leniter curvulis.

On dead oak bark. No. 947.

Cucurbitaria macilentia. *Cooke.*—Cæspitulis minimis, erumpentibus; peritheciis atris, papillatis, sub-nitidis, sicco collapsis; ascis cylindræis; sporidiis uniseriatis, ellipticis, utrinque attenuatis, binucleatis, $\cdot 015 \times \cdot 006$ mm.

On *Abies* and *Libocedrus*. Nos. 747, 757.

Dothidea ribesia. *P.*—(Stylospores). On wild currant. No. 1001.

Sphæria (Fleospora) permunda. *C. in Grevillea.*—On herbs. Sierra Nevada. No. 1032.

Sphæria (Immersæ) tumulata. *C.*—Immersa. Peritheciis subglobosis, atris, ostiis erumpentibus; ascis cylindræis; sporidiis sublanco-latis, obtusis, uniseptatis, atro-brunneis, utrinque hyalino-apiculatis, $\cdot 035$ – $\cdot 04 \times \cdot 012$ mm.

On wood of *Pinus contorta*. Sierra Nevada, 8000 feet. No. 1014.

Allied to *S. apiculata*, but with larger and coarser sporidia, the external appearance is also different.

Erysiphe Montagnei. *Lev.*—On *Apocynum*. No. 730.

NEW JERSEY FUNGI.

By M. C. COOKE and J. B. ELLIS.

(Continued from Vol. VI., p. 96.)

Polyporus (Merisma) Ellisii. *Berk.*

Pileo convexo, reniforme, carnosio-lento, sulphureo, in verrucas farinaceis concoloribus rupto, stipite brevi, velutino, reticulato; poris parvis, angulatis, brevibus decurrentibus.

On the ground in low woods. Newfield, New Jersey. Oct. 13, 1872. Ellis. No. 873.

Pileus $2\frac{1}{2}$ inches across, and long, sulphur-coloured, reniform, convex, unequal, the surface broken up into pulverulent warts, which become scales towards the margin, interstices pulverulentotomentose, margin strongly incurved, flesh nearly snow-white, about

half an inch thick; stem irregular, thickened at the base, $1\frac{1}{2}$ inch high, more than half an inch thick, solid, darker than the pileus, covered with raised reticulations which appear to be abortive pores, slightly branched at the base; pores decurrent, angular, milk-white, about $\frac{1}{36}$ inch diam., about a line deep.

Allied to *P. pes-caprae*. A very curious and distinct species.

Clavaria molaris. Berk.

Erumpens, coccinea, apice verrucosa l. cristata.

On dead branches of *Magnolia glauca*. Newfield, New Jersey, June, 1873. Ellis. No. 892.

About a line high, bursting through the bark, scarlet, thickened upwards. Apex either coarsely warty or with a multitude of crest-like processes; spores clavate, acuminate below, $\cdot0075$ mm., $\cdot0003$ in. long. Allied to *C. contorta*.

Sphaeropsis sassafras. C. & E.

Peritheciis papillaeformibus, epidermide cinctis. Sporis elongato-ellipticis, $\cdot035\text{--}\cdot035 \times \cdot012$ mm., brunneis.

On bark of *Sassafras*. No. 2856.

Sphaeropsis pinastri. C. & E.

Peritheciis papillaeformibus, epidermide cinctis, hinc illic subgregariis. Sporis elongato-ellipticis, brunneis, $\cdot03 \times \cdot012$, vel. $\cdot035\text{--}\cdot04 + \cdot015$ mm.

On Scotch fir. No. 2917.

In some perithecia the spores are larger uniformly than in others.

Sphaeropsis opaca. C. & E.

Peritheciis congestis, in pustulis minimis confluentibus, epidermide cinctis, nec papillatis, dothidioideis. Sporis ellipticis, obtusis, brunneis, $\cdot025\text{--}\cdot03 \times \cdot012$ mm.

On *Artemisia* stems. No. 2854.

Diplodia radicina. C. & E.

Erumpens, gregaria. Peritheciis atris, elevatis, subglobosis. Sporis ellipticis, nec constrictis, brunneis, $\cdot03 \times \cdot01\text{--}\cdot012$ mm.

On roots of *Maclura*. No. 2954.

Diplodia hyalospora. C. & E.

Peritheciis tectis, minimis, puncti formibus, membranaceis. Sporis elongato-ellipticis, subconstrictis, hyalinis, $\cdot02\text{--}\cdot026 \times \cdot009$ mm., hinc illic biseptatis.

On stems of *Chenopodium*. No. 2945.

Sometimes one of the cells is divided, so that the spore is unequally biseptate.

Diplodia hibiscina. C. & E.

Peritheciis atris, depressis, epidermide cinctis, sparsis vel congestis. Sporis ellipticis, vix constrictis, brunneis, inaequalibus, $\cdot025\text{--}\cdot03 \times \cdot012$ mm.

On branches of *Hibiscus*. No. 2939.

Hendersonia anomala. C. & E.

Erumpens. Peritheciis elongatis, atris. Sporis ellipticis, tri-septatis; brunneis, cellulis ultimis hyalinis, quandoque divisis, $\cdot02 \times \cdot01$ mm.

On branches of *Tephrosia Virginiana*.

No. 2887a.

The spores are very peculiar, the two central cells are brown, the terminal cells hyaline, sometimes one or both of the terminal cells is divided and constricted, in which case it is broader than the central cells.

Pestalozzia unicornis. *C. & E.*

Pustulis lirellæformibus, atris. Sporis cylindricis, 5-septatis, brunneis; cellulis ultimis hyalinis, superne unicornutis, inferne longe stipitatis, $\cdot 035 \times \cdot 008$ mm.

On white cedar wood.

No. 2924.

Chaetomella andropogonis. *C. & E.*

Sparsa. Peritheciis brunneis, $\frac{1}{5}$ mm. dia., pilis rigidis erectis ornatis. Sporis ovatis, $\cdot 006 \times \cdot 005$ mm., hyalinis.

On leaves of *Andropogon*.

No. 2827.

Myxormia convexula. *C. & E.*

Erumpens, atro-brunnea. Pustulis orbicularibus, convexis, intus olivaceis, sporis concatenatis, minimis, ellipticis, hyalinis, $\cdot 007 \times \cdot 004$ mm.

On young twigs of *Robinia*.

No. 2906.

Myxormia (?)

On decorticated oak branches.

No. 2809.

This is not a true *Myxormia*, but more resembles a *Peziza* without asci. It is not improbable that it is an imperfect *Discomycete*.

Discosia podisomæ. *C. & E.*

Sparsa. Peritheciis convexis, minimis, opacis. Sporis cylindraceis, curvulis, triseptatis, $\cdot 025$ - $\cdot 028$ mm. long, utrinque aristatis.

On old *Podisoma macropus*.

No. 2931.

Septonema toruloidea. *C. & E.*

Atra, effusa, velutina. Sporis 3-4 septatis, constrictis, brunneis, $\cdot 025$ mm. long, in hyphis simplicibus concatenatis.

On pine slab.

No. 2942.

Speira punctulata. *C. & E.*

Punctiformis, atra. Pustulis minimis, erumpentibus. Sporis subellipticis, applanatis, cellulis quadriseriatis, fuscis, $\cdot 025$ - $\cdot 03 \times \cdot 015$ - $\cdot 018$ mm.

On *Vaccinium*.

No. 2884.

Sporotrichum æruginosum. *Schwarz.*

Probably a form of this.

On pine stump.

No. 2872.

Penicillium repens. *C. & E.*

Argillaceum, effusum. Hyphis repentibus, intricatis; ramis adscendentibus; ramulis patentibus, brevibus, quandoque furcatis; capitulis bifurcatis, hyalinis; sporis globosis.

On rotten *Magnolia*.

No. 2900.

Zygodesmus fuscus. *Corda.*

On old oak log.

No. 2878a.

Zygodesmus bicolor. *C. & E.*

Effusus, centro fuliginous, ambitu luteo-fuscus. Hyphis sterilis

furcatis, croceis, fertilis flexuosis, fuligineis, hinc illic papillatis. Sporis globosis, echinulatis, $\cdot 009$ mm.

On bark of cedar.

No. 2732.

Arthrobotryum robustum. C. & E.

Sparsum, atrum. Stipite robusto, brevi, compacto; capitulo globoso. Sporis pyriformibus, 1-2 septatis, brunneis, $\cdot 03 \times \cdot 01$ mm.

Inside maple bark.

No. 2879.

Habit much resembling a *Didymium*. Capitulum dense and compact.

Dendryphium Ellisii. Oke.

Tenue effusum. Hyphis erectis, opacis, supra breviter ramosis. Sporis cylindraceis, 2-5 septatis, 2-3 concatenatis, $\cdot 03\text{--}\cdot 06 \times \cdot 01$ mm., brunneis.

On cedar wood.

No. 2950.

Peziza (Mollisia) paulupuncta. C. & E.

Gregaria. Cupulis atrobrunneis, minimis, $\frac{1}{4}$ mm., demum appllanatis; disco cinereo. Ascis cylindraceis. Sporidiis linearibus, $\cdot 005 \times \cdot 001$ mm.

On maple bark.

No. 2889.

Peziza (Mollisia) introvixida. C. & E.

Gregaria. Cupulis atro-brunneis, punctiformibus, $\frac{1}{2}$ mm.; disco fuligineo, vel subolivaceo. Ascis cylindrico-clavatis. Sporidiis elongato-ovatis, $\cdot 007 \times \cdot 003$ mm. Paraphysibus filiformibus, supra, et gelatinâ, viridis.

On naked wood.

No. 2883.

Peziza (Dasyscypha) solfatera. C. & E.

Sparsa. Cupulis hemisphericis, citrinis, subtus papillato-affixis, tomentosis, pilis asperulis, granulato-capitatis. Ascis cylindraceis. Sporidiis linearibus, $\cdot 008$ mm. long. Paraphysibus filiformibus.

On pine leaves.

No. 2907.

Peziza (Dasyscypha) theiodea. C. & E.

Sparsa, gilva. Cupulis subglobosis, dein hemisphericis, leniter tomentosis, pulvere sulfureo ubique conspersis. Ascis cylindraceis. Sporidiis globosis, $\cdot 003$ mm. diam.

On decorticated *Rhus venenata*.

No. 2956.

The sulphury powder which covers the cups is sprinkled over the matrix.

Stictis (Xylographa) linearis. C. & E.

Lirellæformis, sparsa, brunnea, disco testaceo. Ascis clavatis. Sporidiis fusoides, triseptatis, hyalinis, $\cdot 015 \times \cdot 006$ mm.

On decorticated oak and *Vaccinium*.

No. 2896.

Phacidium sphæroideum. C. & E.

Gregarium, sphæroidum, cinereum, in lacinas 4-5 obtusas dehiscens, disco cinereo. Ascis clavatis. Sporidiis fusiformibus, hyalinis, $\cdot 02 \times \cdot 006$ mm. Paraphysibus filiformibus.

On leaves of *Ilex glabra*.

No. 2892.

Hysterium stictoideum. C. & E.

Innatum, lanceolatum, ore apertum, disco fusco. Ascis clavatis.

Sporidiis ellipticis, 3-5 septatis, merenchymatis, hyalinis, $\cdot 02\text{--}\cdot 025 \times \cdot 008$ mm.

On decorticated oak. No. 2843.

Hysterium lineolatum. *Cke., in Texas Fungi.*

On old oak stumps. Nos. 2885, 2902.

Hysterium smilacis. *S.*

On *Smilax*. No. 2899.

Nectria aureofulva. *C. & E.*

Cæspitosa, aureofulva, glabra, subnitens. Ascis cylindræcis. Sporidiis uniseriatis, ellipticis, uniseptatis, vix constrictis, hyalinis, $\cdot 012 \times \cdot 005$ mm.

On *Magnolia* bark. No. 2859.

Ceratostoma fallax. *C. & Sacc.*

Peritheciis superficialibus, laxo gregariis, globoso-depressis, $\frac{1}{4}$ mm. diam., in ostiolum filiforme subflexuosum, usque 1 mill long, productis. Peritheci contextu parenchymatico dilute fuligineo ostioli contextu lineari parenchymatico, athermo. Conidiis (?) perithecium conspergentibus globoso-angulosis, $\cdot 015\text{--}\cdot 025$ mm. diam., athermis, quandoque hyalino punctatis. Spermatiis intra perithecium, orientibus minimis oblongis, $\cdot 004 \times \cdot 001\text{--}\cdot 0015$, copiosissimis hyalinis saepe in glomerulis, subglobosis, pluribus coalitis; ascosporis. (?)

On pine boards. No. 2764.

Diatrype rhuina. *C. & E.*

Stroma effusum, ambitu et magnitudine maxime varium. Ieretheciis globosis, in ligno etiolato immersis, ostiolis cylindricis, exsertis. Ascis cylindrico-clavatis. Sporidiis fusiformibus, leniter curvulis, nucleatis, demum, 1-5 septatis, $\cdot 04 \times \cdot 004$ mm.

On *Rhus venenata*. No. 2915.

Diatrype albopruinosa. *Schw.*

On oak and maple. No. 2865.

= *Diatrype Durixi*, Thumen. Myc. Univ. 275.

Melogramma aceris. *C. & E.*

Irregulariter erumpens. Peritheciis confluentibus, subdepressis, atris. Ascis clavatis. Sporidiis longe ellipticis, subcurvulis, brunneis, $\cdot 035\text{--}\cdot 04 \times \cdot 015$ mm.

On branches of *Acer*. No. 2335b.

Valsa myricæ. *C. & E.*

Peritheciis globosis, linea nigra varia circumscriptis, ostiolis cylindricis, in disco plano atro subjunctis. Ascis cylindrico-clavatis. Sporidiis minutis, allantoideis, $\cdot 01\text{--}\cdot 012$ mm. long.

On *Myrica*. No. 2903.

In habit approaching *Diatrype*.

Valsa conscripta. *C. & E.*

Epidermide tecta. Peritheciis subglobosis, ostiolis demum in fissuras lineas erumpentibus. Ascis clavatis. Sporidiis cylindricis, obtusis, curvulis, hyalinis, $\cdot 02 \times \cdot 004$ mm.

On branches of *Carya* and *Comptonia*. No. 2861.

Valsa laurina. *C. & E.*

Epidermide nigrofacta tecta. Pustulis convexis; ostiolis convergentibus. Ascis clavatis. Sporidiis cylindricis, utrinque obtusis, curvulis, hyalinis, $\cdot 02 \times \cdot 004$ mm.

On twigs of sassafras.

No. 2855.

Valsa cenisia. *Not.*

On *Juniperus Virginiana*.

Nos. 2853, 2910.

Valsa personata. *C. & E.*

Pustulis variis, tectis. Peritheciis in ligno immersis, nigrocinctis. Ascis clavatis. Sporidiis lanceolatis, uniseptatis, quadrinucleatis, $\cdot 025\text{--}\cdot 028 \times \cdot 006$ mm.

On *Robinia pseudacacia*.

No. 2918.

Valsa rhuiphila. *C. & E.*

Pustulis orbicularibus. Peritheciis globosis, congestis; ostiolis in disco brunneo, dein atra, erumpentibus. Ascis clavatis. Sporidiis hyalinis, allantoideis, circa $\cdot 01$ mm. long.

On *Rhus venenata*.

No. 2957.

Valsa (Diaporthe) paulula. *C. & E.*

Pustulis minimis, epidermide tectis. Peritheciis subglobosis, ostiolis brevibus erumpentibus. Ascis clavatis. Sporidiis arete fusiformibus, quadrinucleatis, $\cdot 016\text{--}\cdot 018$ mm. long.

On twigs of *Nyssa*.

No. 2943.

Valsa parasitica. *C. & E.*

Circinata. Peritheciis globosis, parvulis, decumbentibus, ostiolis elongatis, subflexuosis, supra fuscis. Ascis clavatis. Sporidiis allantoideis, minimis, $\cdot 006$ mm. long.

On old *Massaria sudans*.

No. 2844.

Growing beneath the cuticle over old pustules of *Massaria*.

Valsa obtecta. *C. & E.*

Pustulis minimis, ovatis. Peritheciis 3-5 globosis; ostiolis supra attenuatis, erumpentibus. Sporidiis allantoideis, $\cdot 014\text{--}\cdot 015 \times \cdot 0035$ mm.

On *Clethra alnifolia*.

No. 2513b.

Resembling *Valsa cypri*, Tul., but the ostiola are not united.

Sphæria (Pertusæ) albocincta. *C. & E.*

Sparsa. Peritheciis, hemisphericis, atris, mycelio albo cinctis, poro pertusis. Ascis clavatis. Sporidiis lanceolatis, utrinque obtusis, triseptatis, subconstrictis, hyalinis, $\cdot 03\text{--}\cdot 033 \times \cdot 012$ mm.

On pine and cedar wood.

No. 2866.

Sphæria (Immersæ) picacea. *C. & E.*

Peritheciis globosis, subgregariis, in maculas nigrofactas immersis. Ascis cylindræis. Sporidiis uniseriatis, cylindricis, obtusis, rectis, fuscis, $\cdot 016 \times \cdot 004$ mm.

On decorticated *Vaccinium*.

No. 2846.

Sphæria (Obtectæ) biglobosa. *C. & E.*

Epidermide nigrofacta tecta. Peritheciis depressis. Ascis cylindræis. Sporidiis uniseriatis, ellipticis, uniseptatis, forte constrictis, hyalinis, $\cdot 014 \times \cdot 007$ mm., cellulis globosis.

On sassafras.

No. 2905.

Sphæria (Obtectæ) thyoidea. *C. & E.*

Described as belonging to the "Immersæ," but really of the section "Obtectæ."

On *Juniperus Virginiana*.

Nos. 2929, 2927.

Sphæria (Obtectæ) squamata. *C. & E.*

Sparsa, tecta. Peritheciis globoso-depressis, demum epidermide lacerato cinctis. Ascis amplis, saccatis. Sporidiis lanceolatis, triseptatis, hyalinis, $\cdot 025 \times \cdot 006$ mm.

On fir twigs.

No. 2922.

Sphæria (Obtectæ) castanella. *C. & E.*

Peritheciis epidermide lacerato tectis, hinc illic gregariis. Ascis clavatis. Sporidiis biseriatis, $\cdot 016 \times \cdot 003$ mm., cylindricis, uniseptatis, hyalinis.

On twigs of *Castanea*.

No. 2948.

Sphæria (Obtectæ) tephrosiæ. *C. & E.*

Sparsa primo tecta, demum apice nuda. Ascis cylindraceis. Sporidiis uniseriatis, arcte lanceolatis, 1-3 septatis, fuscis, $\cdot 03 \times \cdot 006$ mm.

On *Tephrosia Virginiana*.

No. 2887.

Sphæria (Thyridium) ambleia. *C. & E.*

Sparsa. Peritheciis atris, sub-prominulis, tectis. Ascis clavato-cylindricis. Sporidiis late lanceolatis, vel ellipticis, centro constrictis, merenchymatis, fuscis, $\cdot 025 \times \cdot 01$ mm.

On *Carya* and *Azalea*.

No. 2834.

Sphæria pustulata. *Sacc.*

On *Corylus*.

No. 2838.

Sphæria (Diaporthe) cryptica. *Nke.*

On *Lonicera*.

No. 2933.

Sphæria (Obtectæ) filispora. *C. & E.*

Sparsa. Peritheciis subprominulis, epidermide cinereo tectis. Ascis cylindraceis. Sporidiis filiformibus, $\cdot 13$ mm. long.

On *Smilax* twigs

No. 2864.

Sphæria (Caulicolæ) Bokonia. *C. & E.*

Sparsa. Peritheciis membranaceis, brunneis, subglobosis, epidermide tectis. Ascis clavatis. Sporidiis biseriatis, lanceolatis, rectis vel curvulis, 3-septatis, pallide fuscis, $\cdot 03 \times \cdot 005$ mm.

On stems of *Bokonia*.

No. 2955.

REHM'S ASCOMYCETEN.

The 10th fasciculus of this excellent collection has just reached us. In quality the specimens seem to be fully equal to those contained in previous fasciculi, but in quantity there appears to be a visible decline from the liberal supply which characterized the earlier fasciculi.

CALIFORNIAN FUNGI.

(Collected by Dr. W. H. HARKNESS. Determined by J. E. VIZE.)

Asteroma rosæ. D.C.—On rose leaves. No. 723.

Discella anomala. Cooke.—Pustulis sparsis, orbicularibus, atris, epidermide tectis; sporis fusiformibus, endochromate bipartito, hyalinis. $\cdot 07 \times \cdot 01$ mm.

On *Yucca draconis*. No. 692.

The habit is that of *Discella*, but the spores resemble those of *Bactridium*.

Sporidesmium induratum. Cooke.—Effusum, atrum; sporis subglobosis, irregularibus, induratis, opacis, e cellulis angulatis compositis.

On leaves of *Arctostaphylos*. No. 683.

Very firm and compact, almost like a small *Sclerotium*, each mass composed of smaller subglobose portions which separate with difficulty, and these again are divided into irregular cells.

Phragmidium gracile. Grev.—On wild raspberry. No. 337.

Gymnosporangium biseptatum. Ellis.—On green twigs of *Libocedrus decurrens*. No. 581.

Puccinia xanthii. Sch.—On *Xanthium strumarium*. No. 258.

Puccinia berberidis. Mont.—On leaves of berberry. No. 687.

Puccinia helianthi. Sch.—On *Helianthus Californica*. No. 266.

Puccinia graminis. Pers.—On native grass. No. 269.

Puccinia artemisiarum.—Duby.—On *Artemisia*. Nos. 293, 294.

Puccinia angustata. Peck.—On *Juncus*. Nos. 309, 310, 314.

Puccinia splendens. n. s.—Amphigena, magnis acervis formantibus densas maculas cinctas fibra, sporidiis brunneis, medio vix constrictis, obtusis, $\cdot 05 \times \cdot 035$ of mm. long.

On *Onion* or rabbit bush. No. 678.

Puccinia obtusa. Schr.—On white sage. No. 695.

Puccinia œnotheræ. Vize.—On *Ænothera strigulosa*. No. 705.

Puccinia Harknessi. n. s.—Acervulis parvis, oblongis, fuscis, demum erumpentibus epiderme cinctis, stipite parvo fultis; sporidiis oblongis, brunneis, in medio pæne æqualiter septatis, $\cdot 05$ mm. long, $\cdot 025$ mm. crass.

On branches of *Zygodesmia*, Sierra Nevada, at an altitude of 7,000 feet. No. 742.

Puccinia saniculæ. Grev.—Uredo form. The spores in this plant are immensely large compared with our British plants.

On stems of *Sanicula*. No. 1070.

Uromyces trifolii. D.C.—On clover leaves. No. 706.

Uromyces junci. Tul.—On *Juncus*. Nos. 253, 700.

Uromyces junci. Schw. var. **Scirpi.**—On *Scirpus triquetra*. No. 316.

Uromyces appendiculata. Lev.—Nos. 270, 674.

Uromyces prunorum. Lk. var. **Amygdali.**—On peach leaves. No. 305.

Ustilago bromivora. F. de W.—On grass. No. 724.

Uredo lupini. B. & C.—On *Lupin*. Nos. 281, 719.

Uredo scirpina. West.—On *Scirpus*. No. 312.

Ræstelia cancellata. Ret.—On pear leaves. No. 334.

Æcidium gayophyti. n. s.—Hypophyllum, cupulis coccineis irregulariter dispositis, gregariis vel solitariis, primo epiderme tectis demum liberis; sporidiis irregulariter globosis vel polygonis, 1-4 nucleis coccineis.

On leaves of *Gayophytum*. No. 752.

Cladosporium delicatulum. Cooke.—On leaves. No. 718.

Cladosporium herbarum.—On *Typha*. Nos. 672, 698.

Cladosporium epiphyllum. Corda.—On poplar leaves. No. 335.

Aspergillus glaucus. Lk.—On *Larix Europæa*. No. 702.

Ramularia obovata. Fekl.—On *Rumex*. No. 280.

Oldium Tuckeri. B. & Br.—On vine leaves. No. 751.

Fusarium personatum. Cooke.—Pusillum, pallidum, hyphis abbreviatis; sporis fusiformibus, curvatis, .03 mm. long.

Scattered over the leaves of *Oreodaphne Californica*. No. 333.

Scarcely visible to the naked eye; mixed with a sterile *Sphærella*, probably *S. maculæformis*.

Cercospora inquinans. Cooke.—Amphigena, atra; hyphis fasciculatis, brevibus, fuligineis; sporis abbreviatis, obclavatis, robustis, 1-3 septatis, fuligineis, .03-.07 \times .006 mm.

On leaves of *Gymnocarpus*. No. 260.

Sphæria yuccægena. Cooke.—Gregaria, tecta; peritheciis prominulis, atris; ascis cylindraceis; sporidiis uniseriatis, ellipticis, uniseptatis, constrictis, brunneis, .028 \times .01 mm.

On *Yucca*. No. 693.

Sphæria palmacea. Cooke.—Immersa, tecta; peritheciis minimis, subglobosis; ascis cylindraceis; sporidiis ellipticis, uniseriatis, constrictis, brunneis, .013 \times .006 mm.

On palm leaves. No. 717.

Only visible through the cuticle when moist.

Sphæria Vizeana. Cooke.—Caulicola, sparsa; peritheciis atris, prominulis, ascis clavatis; sporidiis biseriatis, subellipticis, uniseptatis, hyalino-luteolis, .03 \times .01 mm.

On stems of *Lathyrus venosa*. No. 753.

Quite different from *S. lathyrina*, B. & C.; upper cell of sporidia broadest.

Sphæria herbarum. *Pers.*—On stems of soap plant. No. 707.

The ascus contains 16 sporidia, and therefore adds to the varieties already recorded of this plant.

Sphæria conficta. *Cooke.*—Epiphylla, maculis retundatis, brunneis; peritheciis in centro gregariis; ascis clavatis; sporidiis filiformibus, nucleatis, .06 mm. long.

On leaves of *Quercus*. No. 691.

Phyllactinia guttata. *Lev.*—On fallen leaves. Nos. 328, 331, 690.

Erysiphe Martii. *Lk.*—On clover. No. 706.

Rhytisma arbuti. *Phillips.*—Hypophylla, innata, in maculis, rugosis atris irregularibus confluentibus, dirumpens, in rotundis flexuosis fissuris, disco brunneo, atro; ascis latis sub-clavatis, sporidiis filiformibus.

On *Arbutus* leaves. No. 336.

Rhytisma. sp.—Immature. On Balm of Gilead. No. 682.

SOME EXTRA-EUROPEAN FUNGI.

By M. C. COOKE.

A small collection of fungi from Mr. W. R. Gerard, collected in the State of New York, included the following species:—

160 **Sphærella nigrita.** *Cke.*

Hypophylla. Peritheciis semi-immersis, in maculis orbicularibus nigrofacticis congestis. Ascis clavatis; sporidiis elongato-ellipticis, uniseptatis, hyalinis ($.015 \times .004$ mm.).

On oak leaves.

161. **Tubercularia nigricans.** *Link.*

173. **Polyporus radiatus.** *Fr.*

176. **Sphærospora fusispora.** *C.*

178. **Polyporus gilvus.** *Schw.*

179. **Diatrype quercina.** *Fr.*

182. **Polyporus poripes.** *Fr.*

193. **Sphæria acuminata.** *Sow.*

195, 203. **Valsa stellulata.** *Fr.*

196. **Sphæria doliolum.** *Pers.*—On herbaceous stems.

198. **Sphæria stictostoma.** *B. & C.*—On herbaceous stems.

199. **Diatrype verrucæformis.** *Fr.*

200. **Peziza pteridis.** *A. & S.*

202. **Peziza fusca.** *Pers.*

204. **Sphærospora puncta.** *C. & E.*—On *Lonicera*.

205. **Sphæria anguillida.** *C. & E.*—On herbs.

206. **Sphærospora celtidis.** *Curt.*—On galls of *Celtis*.

207. **Diplodia compacta.** *C. & Gr.*

Pustulis erumpentibus, epidermide cinctis. Peritheciis confluentibus, obtusis; sporis ellipticis, vel biglobosis, brunneis, constrictis (0.03×0.18 mm.).

On branches.

208. **Fusarium glandicolum.** *C. & Gr.*

Roseum, subglobosum dein confluens; sporis ellipticis (0.008×0.004 mm.).

On acorns.

210. **Peziza virginea.** *Batsch.*211. **Microthyrium smilacis.** *Not.*—On *Smilax*.212. **Stictis patellea.** *Cke.*

Sparsa, orbicularis, concava, immersa, disco cervino; ascis clavatis; sporidiis lanceolatis, 3 septatis, hyalinis (0.02×0.005 mm.).

On naked wood.

216. **Sphæria modesta.** *Desm.*—On herbs.215. **Peziza vinosa.** *A. & S.*217. **Myrothecium inundatum.** *Tode.*—On dead fungi.220. **Pestalozzia guépini.** *Desm.*—On *Camellia* leaves.221. **Nectria epispheia.** *Tode.*—On old *Hypoxylon*.222. **Cucurbitaria cupularis.** *Fr.*223. **Dothidea smilacicola.** *C. & G.*

Sparsa, atra, erumpens, convexa; ascis cylindraccis; sporidiis biglobosis, valde constrictis, brunneis ($0.018-0.02 \times 0.01$ mm.).

On *Smilax* twigs.

224. **Melogramma ambiguum.** *Schw.*—On branches of *Rhus*.225. **Helicoma Berkeleyi.** *Curt.*226. **Mystrosporium aterrimum.** *B. & C.***Erysiphe Montagnei.** *Lev.*—On *Strumarium*.**Hysterium viticolum.** *C. & P.*—On *Vitis*.

The following specimens were sterile:—191, 192, 194, 209, 213, 214, 216, 218, 225.

Dr. Bancroft also placed in our hands a very interesting species of *Hypocrea*, found on the leaves of the nutmeg tree at Singapore. This does not appear to have been hitherto described.

Hypocrea scutata. *Cke.*

Epiphylla, orbicularis, scutellata, convexa, glabra, aurantia, infra puncto centrali affixa; carne stramineo, ceraceo, radiato-celluloso; peritheciis tenuis, immersis, extus nec conspicuis; ascis elongato-cylindraccis, 3 mm. long; sporidiis filiformibus, multiseptatis, in frustulis, 0.01 mm. long, dissilientibus.

On leaves of *Myristica*. Singapore.

The peltate discs are about $\frac{1}{2}$ to 1 centimetre in diameter, somewhat resembling button galls, but quite smooth, of a bright ochraceous orange colour, and of a resinous or waxy appearance; the sporidia are nearly as long as the asci.

Amongst some fragments of petioles of *Astrocaryum*, from Brazil, specimens of a superficial *Sphæria* were found, of which the following is a description:—

***Sphæria (Denudatæ) astrocaryi.* Cooke.**

Subgregaria, vel sparsa, atra; peritheciis superficialibus, rugosis, vix papillatis; ascis clavatis; sporidiis fusiformibus rectis, vel leniter curvulis, multiseptatis (8-10) hyalinis, $\cdot 06\text{--}\cdot 07 + \cdot 007$ mm.

On petioles of *Astrocaryum*, Brazil.

At length we have succeeded in obtaining, through Mr. G. Western, of Madras, specimens of one of the kinds of smut which affects rice in India. It is of a dingy olive colour, pulverulent, and surrounds the grain, destroying the whole substance, except a small portion in the centre. See "Fungi, their Nature," &c., p. 224.

***Ustilago virens.* Cooke.**

Pulverulentum, effusum, olivaceo-virens; sporis globosis, olivaceo-fuscis, episorio granulosus, $\cdot 005$ mm.

On grains of rice (*Oryza sativa*.) Tinnevely, India.

***Penicillium tenellum.* Cke.**

Effusum, pallide fumosum. Hyphis gracilibus, simplicibus vel furcatis, brevibus, septatis, diaphanis; sporis globosis, minimis, hyalinis, $\cdot 003$ mm. diam.

On fading leaves of *Symplocos*. Bengal, India.

The effused patches are as much as an inch in diameter, but very thin, and but little darker than the leaf. The threads are very delicate and short, not exceeding one-tenth of a millimetre.

NORTH AMERICAN ALGÆ.

The second fasciculus of "Algæ Am. Bor. Exsiccatae," by Farlow, Anderson, and Eaton, is just issued, and contains—

51. *Dasya elegans.* Ag.
52. *Polysiphonia Woodii.* Harv.
53. *Polysiphonia verticillata.* Harv.
54. *Bostrychia rivularis.* Harv.
55. *Rhodomela subfusca.* Ag., var. *firmior forma juvenilis.* Ag.
56. *Odonthalia dentata.* Lyngb.
57. *Chondria atropurpurea.* Harv., var. *tenuior.* Farlow.
58. *Ricardia Montagnei.* Derb. & Sol., var. *gigantea.* Farlow.
59. *Laurencia pinnatifida.* Lam'x., var. *spectabilis.*
60. *Laurencia virgata.* J. Ag.
61. *Laurencia intricata.* Kütz.
62. *Laurencia tuberculosa.* J. Ag., var. *gemmafera.* J. Ag.

63. *Laurencia papillosa*. *Grev., var. subsecunda. Kütz.*
64. *Grinnellia Americana*. *Harv.*
65. *Delesseria quercifolia*. *Bory.*
66. *Delesseria (Caloglossa) Leprieurii*. *Mont.*
67. *Nitophyllum spectabile*. *Eaton.*
68. *Nitophyllum latissimum*. (*Harv.*) *J. Ag.*
69. *Nitophyllum Fryeanum*. *Harv.*
70. *Liagora valida*. *Harv.*
71. *Liagora Cheyneana*. *Harv.*
72. *Nemalion?* *Andersonii*. *Farlow.*
73. *Plocamium coccineum*. *Lyngb., var. Californica.*
74. *Euthora cristata*. *Ag.*
75. *Lomentaria Baileyana*. (*Harv.*) *Farlow.*
76. *Rhabdonia Coulteri*. *Harv.*
77. *Cordylecladia conferta*. *Ag.*
78. *Halosaccion ramentaceum*. *Ag.*
79. *Gigartina microphylla*. *Harv., var. horrida. Farlow.*
80. *Halymenia decipiens*. *Ag.*
81. *Prionitis lanceolata*. *Harv.*
82. *Ptilota asplenioides*. *Ag.*
83. *Ptilota densa*. *Ag.*
84. *Ptilota elegans*. *Bonnem.*
85. *Ptilota plumosa*. *Ag., var. serrata. Kütz.*
86. *Microcladia Coulteri*. *Harv.*
87. *Microcladia Californica*. *Farlow.*
88. *Griffithsia Bornetiana*. *Farlow.*
89. *Callithamnion (Antithamnion) Americanum*. *Harv.*
90. *Callithamnion pellucidum*. *Farlow.*
91. *Zonaria Tournefortii*. (*Lam'x.*)
92. *Zonaria lobata*. *Ag.*
93. *Dictyota Kunthii*. *Ag.*
94. *Chordaria abietina*. *Ruprecht in Herb. Petrop.*
95. *Dictyosiphon hippuroides*. (*Lyngb.*) *Aresch.*
96. *Caulerpa ericifolia*. *Ag.*
97. *Dasycladus occidentalis*. *Harv.*
98. *Monostroma Blyttii*. (*Aresch.*) *Wittr.*
99. *Botrydium gregarium*. (*A. Braun.*)
100. *Nostoc flagelliforme*. *Berkeley & Curtis.*

We commend this collection of the Algæ of the United States to our readers. The specimens are carefully determined by gentlemen thoroughly competent for the work, and although there are numerous collections of fungi, some good, and some indifferent, constantly in course of issue, it is but rarely that collections of Algæ make their appearance. We do not hesitate to pronounce in favour of the excellent quality of the above series now in course of publication.

HEPATICÆ BRITANNICÆ EXSICCATÆ.

The following is a list of the species contained in the first fasciculus of this work, by Dr. Carrington and W. H. Pearson.

1. *Gymnomitrium concinnatum*. *Corda*.
- 2, 3. „ *crenulatum*. *Gotsch*.
4. *Nardia sphacelata*. *Carr*.
5. „ *adusta*. *Carr*.
- 6, 7. „ *scalaris*. *Gr. & B*.
- 8, 9. „ *compressa*. *Gr. & B*.
- 10, 11. *Trichocolea tomentilla*. *Dmrt*.
- 12, 13, 14. *Saccogyna viticulosa*. *Dmrt*.
15. *Plagiochila tridenticulata*. *Tay.*, & *exigua?* *Tay*.
- 16, 17. *Scapania resupinata*. *Dmrt*.
18. „ *Bartlingii*. *Nees*.
19. „ *compacta*. *Dmrt*.
20. „ *umbrosa*. *Dmrt*.
- 21, 22. „ *undulata*. *Dmrt*.
- 23, 24. *Diplophyllum albicans*. *Dmrt*.
25. „ *Dicksoni*. *Dmrt*.
26. *Jungermannia crenulata*. *Smith*.
27. „ *cordifolia*. *Hooker*.
- 28, 29. „ *inflata*. *Hudson*.
30. „ *intermedia*. *Ldg*.
31. „ *Lyoni*. *Taylor*.
32. „ *stellulifera*. *Taylor*.
33. „ *Starkii*. *Nees*.
34. „ *curvifolia*. *Dicks*.
35. *Anthelia julacea*. *Dmrt*.
36. *Lophocolea heterophylla*. *Dmrt*.
37. *Lepidozia reptans*. *Dmrt*.
38. „ *cupressina* var. *tumidula*. *Carr*.
39. *Bazzania trilobata*. *G. & B*.
- 40, 41. *Physiotium cochleariforme*. *Nees*.
42. *Herbertia adunca*. *Gr & B*.
43. *Radula aquilegia*. *Taylor*.
44. „ *voluta*. *Taylor*.
45. *Porella laevigata*. *Lindb*.
46. „ *Thuja*. *Lindb*.
47. *Frullania dilatata*. *Dmrt*.
48. „ *Tamarisci*. *Dmrt*.
49. „ „ var. *cornubica*. *Carr*.
50. „ *Hutchinsiae*. *Nees*.
51. *Lejeunia minutissima*. *Dmrt*.
52. „ *ovata*. *Taylor*.
- 53, 54. *Fossombronina caespitiformis*. *De Not*.
- 55, 56. „ *angulosa*. *Raddi*.

- 57, 58. *Fegatella conica*. *Corda*.
 59. *Riccardia pinguis*. *Gr. & B.*
 60, 61. „ *sinuata*. *Gr. & B.*
 62. „ *multifida*. *Gr. & B.*
 63. „ „ *var. ambrosioides*. *Nees*.
 64. *Targionia hypophylla*. *L.*
 65. *Riccia nigrella*. *D.C.*
 66. „ *glaucescens*. *Carr., Mss.*
 67. „ *tumida*. *Ldg*
 68. *Jungermannia laxifolia*. *Hooker*.
 69. *Odontoschisma denudatum*. *Dmrt.*
 70. *Chilosecyphus polyanthos*. *Dmrt.*
 71. *Porella platyphylla*. *Dmrt.*
 72, 73. *Metzgeria furcata*. *Dmrt.*
 74. *Jungermannia attenuata*. *Ldg.*
 75. *Lejeunia hamitifolia*. *Dmrt.*

ON ANTHRACNOSE—A NEW DISEASE OF THE VINE.

By DR. MAXIME CORNU.*

The vineyards of the Narbonne district have been attacked this year by a new disease, caused by a special Fungus, which, I believe, with Monsieur Planchon to be identical with the *Phoma uvicola*.† This disease, which has received the name of anthracnose, is characterised by its peculiar effects on the boughs and leaves, and on the grapes. This parasite produces on the grapes a circular spot—black, as if burnt—in the middle of which a smaller white circle is seen, formed by the development of the conidiiferous form of the fungus.

On the stem, these black spots become depressed circles; the stem appears corroded and burnt through to the woody tissue, sometimes to the pith; it is this peculiar effect which has caused the disease to be sometimes designated by the characteristic name of “Chancere” (canker). On the leaves, spots of different sizes are seen, more or less confluent, formed by the dried-up tissue which has been affected by the influence of the parasite.

I have received from Monsieur Blavet, President of the Society of Agriculture of Étampes, leaves and bunches of grapes, showing a disease which has alarmed the vinegrowers of that district. The grapes, scarcely ripe, showed circular black spots, which appeared to radiate from the point of attachment of the grape; the leaves, partially dried up, were covered in some places rather abundantly with a brown mould.

* Translated from the Bulletin of the Botanical Society of France.

† “Comptes rendus de l’Académie,” August, 1877.

The anatomical examination of a single grape showed an abundant mycelium, spreading through the whole of the substance of the tissue, and frequently ramifying. The peripheral portions of the grape contained the earlier stages of the mycelium.

This mycelium is relatively large and black in colour; the septa are numerous, and the articulations are filled with minute oleaginous globules; it presents in places a felted appearance, the early state of a second form of fructification which has not arrived at maturity. These peculiarities of structure and appearance are those of a *Pleospora* or a *Cladosporium*. The leaves showed on their lower surface numerous conidiiferous tufts of a fungus belonging to this last genus, the nature of which I was able to ascertain. A transverse section of the leaf shows that the filaments proceed from the stomata, and escape in order to form their spores. The filaments are blackish brown, septate, ramifying but little, and produce at their extremities small spores either simple or multilocular. The spores are oval, and variable in form and diameter; they are frequently elongated and acuminate at their point of insertion.

The form, the dimensions, the nature of the spores and of the mycelium, of which in all their parts the diameter is ten times greater than that of the corresponding parts of the parasite which causes the anthracnose, prevents the supposition that these two diseases of the vine can have any relation to each other. The grapes are not attacked by the anthracnose in any definite spot, but it is near the point of attachment that this new disease first appears; by this peculiarity alone, one is enabled at the first glance to distinguish between these two diseases.

It is probable that the vine disease of Étampes ought to be referred to the *Cladosporium*, developing itself at the expense of living plants, in the same manner as that species which produces the speckled appearance on pears, and which has been studied lately by Monsieur Prillieux, a member of our Society.* Our species appears to be identical with the *Cladosporium viticolum* Ces.† This species does not appear to be of rare occurrence in our vineyards. I have met with it several times, both in the plain of Montpellier, and at Cognac, during the numerous excursions I made through the vine district when engaged in my researches on the Phylloxera.

The vines cultivated in these districts have generally cottony leaves, and the parasite which is found on the lower surface of the leaf, always covered with a thick down, forms greyish spots; these spots are caused by the abundant spores, mixed with hairs twisted together. The presence of these grey spots is perhaps the only character indicating the existence of this fungus, of which the bad effects appear to be easily overlooked. I have never observed any bunch of grapes attacked and blackened

* "Comptes rendus de l'Académie," September, 1877.

† "Klotzsch et Rabenhorst Fungi germ," t. xix., 1854, No. 1877.

like those I received from Monsieur Blavet. Perhaps the development of the *Cladosporium* and of the anthracnose may be attributed to the unusual rainfall of this year, and which may make these species formidable in wet seasons.

I do not hesitate to consider the development of the *Cladosporium* as the cause and not as the effect of the disease: this last hypothesis will not stand examination. This *Cladosporium* is developed on plants in perfect health, and on portions which are not in the least decayed; the same is the case with *Cl. dendriticum*, which attacks Pear trees and Service trees, and which may serve to corroborate what I have just stated. It may perhaps be interesting to state here that I found an allied species probably new to the French flora, last September. Numerous plants of *Vincetoxicum officinale* were growing on calcareous rocks, at a few feet from the fine cascade formed by the fall of the Doubs and called the "Saint du Doubs."

The leaves of this plant showed on their lower surface a black down, caused by a parasitic fungus. Microscopical examination revealed the existence of a *Cladosporium*, of which the filaments escaped from the tissue of the leaf by the openings of the stomata; the parenchyma was traversed by the mycelium, which, here and there, had formed knots or filaments felted together, probably the commencement of a second kind of fructification. It was the *Cl. Bellynckii* Westendorp, which that author has published in his *Exsiccata*.

This species is closely related to the *Cladosporium* of the Vine and Rosaceæ; it deserves to be studied carefully as well as the others, as it would be interesting to know the form and nature of its other modes of reproduction. The genus *Cladosporium* includes plants varying much from each other, and which all belong to the Ascomycètes.

FUNGI OF CALIFORNIA.

(Collected by Dr. H. W. HARKNESS and Mr. J. P. MOOR.)

By WILLIAM PHILLIPS, F.L.S.

Having received a further consignment of fungi from Dr. Harkness and Mr. J. P. Moor, collected in California, chiefly belonging to the sections Myxomycetes and Discomycetes, I propose to give an account of such species as have not been recorded in my former papers. ("Grevillea," Vol. v., p. 35 and p. 113.) The ground searched by these gentlemen were the forests bordering the coast of the Pacific, in which the red wood (*Sequoia sempervirens*) abounds, having an elevation of 4,500 feet above the level of the sea, and the Yosemite Valley, in which the big trees (*Sequoia gigantea*) are found, having an elevation of 5,000 feet above the level of the sea.

Dr. Harkness directed his attention especially to the fungi found growing on the bark and wood of the above-named trees, and, as might have been anticipated, he has found several species new to science, besides a large number of already described species.

Didymium clavus. *A. & S.*—No. 504.

Comatricha Friesiana. *D'By.*—No. 647.

Comatricha typhina. *Roth.*—No. 968.

Dictydium cernuum. (*Pers.*)—Immature. No. 606.

Trichia varia. *Pers.*—Nos. 590, 997, 1039 ?

Arcyria nutans. *Bull.*—No. 469.

Lycogala epidendrum. *Bux.*—Nos. 447, 524, 895.

Cyathus striatus. *Hoffm.*—No. 477.

Fusisporium *sp.?*—On fruit of *Oreodaphne Californica*. No. 505.

Stilbum fimetarium. *B. & Br.*—No. 550.

Reissia semiophora. *Fresen.*—No. 605.

Myxotrichum ochraceum. *B. & Br.*—No. 884.

Chaetomium elatum. *Kze.*—No. 554.

Peziza fulgens. *Pers.*—Nos. 611, 658.

Peziza bufonia. *Pers.*—No. 932.

Peziza (Cupulares) secreta. n. s.—Gregarious, sessile or sub-stipitate, medium sized, salmon-coloured, concave, sulcate towards the base; margin thin, crenulate; asci cylindrical; sporidia 8, elliptical, smooth, hyaline, $\cdot 016\text{--}\cdot 018 \times \cdot 009\text{--}\cdot 01$ mm.; paraphyses filiform.

On the earth in dense forests. No. 994.

This differs from *Peziza crenulata*, B. & Br., in colour, the paraphyses not being thickened upwards, the smaller sporidia, and growing on the earth.

Peziza (Cupulares) sub-urceolata, n. s.—Gregarious, stipitate, small, at first urceolate campanulate, then concave, smooth, pale orange, or pale tan-coloured; margin thin, crenulate; stipes short, rather thick; asci cylindrical; sporidia 8, oblong-ovate, $\cdot 019 \times \cdot 008$ mm., smooth, hyaline; paraphyses filiform, numerous.

On the earth attached to buried fragments of wood by an abundant mycelium. In very young specimens the mouth of the cup is merely a minute pore, around which the edge forms a thin membrane or veil. No. 914.

Peziza carbonaria. *A. & S.*—No. 637.

Peziza hinnulea. *B. & Br.*—No. 978.

Peziza macrocystis. *Cooke.*—No. 922.

Peziza (Humaria) gemmea. n. s.—Gregarious, small, sessile, fleshy, at first sub-turbinate, then expanded; disc blood-red; externally pale-red, smooth; asci cylindrical; sporidia 8, sphæ-

rical, smooth, hyaline, .008-.009 mm.; paraphyses filiform, branched at the summits 1-4 times.

On decaying foliage of *Sequoia sempervirens*. No. 876.

This is very near *Peziza constellatio*, B. & Br., from which it differs in the size of the sporidia.

Peziza scubalonta. Cooke.—No. 507.

Peziza (Sarcoscyphæ) sequoia. n. s.—Gregarious, sessile, medium size, concave, fleshy; clothed externally with a dense coat of brown, septate, entangled hairs, which are larger and straighter near the margin; disc reddish flesh-colour; asci cylindrical; sporidia 8, ovate, smooth, hyaline, .017-.02 × .012-.013 mm.; paraphyses linear, simple, slightly enlarged upwards.

On dead twigs of *Sequoia gigantea*. Nos. 636, 638.

Peziza clandestina. Bull.—No. 1034.

Peziza sanguinea. Pers.—On dead black oak. No. 594.

Peziza relicina. Fr.—On spikenard stems. No. 992.

Peziza acutipila. Karst.—On wild raspberry. No. 900.

Peziza acuum. Fr.—On foliage of *Sequoia sempervirens*. Nos. 887, 933, 1021.

Peziza (Dasyscyphæ) setigera. n. s.—Gregarious, sessile, small, concave, clothed externally with brown, septate, rigid hairs; disc brownish flesh-colour; asci clavate; sporidia 8, oblong, .016 × .0035 mm., paraphyses broad, exceeding the asci in length, pointed at the summit.

On dead stems of a species of *Aralia*. No. 981. This differs from its congeners in the much larger sporidia, asci, and paraphyses.

Peziza (Dasyscyphæ) scabro-villosa. n. s.—Gregarious, stipitate; disc yellowish-white; cup clothed externally with rather long scabrous, white hairs, often surmounted with a head of angular granules; asci cylindrical; sporidia 8, fusiform, .015-.021 × .002-.003 mm.; paraphyses broad, pointed at the summit, exceeding the asci in length.

On *Rubus nutkanus*. No. 982.

Peziza subtilissima. Cooke.—On spruce. No. 1029.

Peziza Agassizii, B & C. var. **rufipes.** n. var.—The colour of the stem may justify this being regarded as a variety.

On *Pinus contorta*. No. 1019.

Peziza cupressina. Batsch.—On dead foliage of *Sequoia sempervirens*. No. 869.

Peziza pithya. Pers.—On bark of *Sequoia sempervirens*. No. 894.

Peziza fusca. Pers.—Nos. 500, 610.

Peziza bulgarioides. Rabh.—On dead cones of *Sequoia gigantea*. No. 635.

Peziza nigrescens. *Cooke.*—No. 1008.

Peziza (Hymenoscyphæ) alutipes. n. s.—Gregarious, stipitate, infundibuliform, then plane, tan-colour, margin entire; stem firm, long, slender, and flexuous, or short, slightly enlarged at its junction with the rugose cup, concolorous; asci clavate, broad; sporidia 8, oblong-ovate, multinucleate; $\cdot 018\text{--}\cdot 02 \times \cdot 005\text{--}\cdot 008$ mm.; paraphyses filiform, thicker at the top, adherent, somewhat coloured.

On decaying foliage of *Libocedrus decurrens*. No. 993.

Peziza caucus. *Rebent.* var. **fusco.purpurea.** n. v.—On dead foliage of cedar. No. 1081. I have grave doubts as to the propriety of referring this to Rebentisch's species.

Peziza vinosa. *A & S.*

Helotium aureum. *Pers.*—No. 976.

Cenangium sequoiae. *Plowright in litt.*—Gregarious, turbinate, black, margin connivent; disc black, pale, cinerious within; asci broadly clavate; sporidia 8, ovate, or ovate-oblong, simple, or tri-septate, enucleate, $\cdot 025\text{--}\cdot 03 \times \cdot 007\text{--}\cdot 015$ mm.; paraphyses slender, furcate. On *Sequoia gigantea*. No. 639.

Cenangium prunastri. *Fr.*—No. 579.

Dermatea flavo-cinerea. n. s.—Gregarious, sessile, at first hemispherical, then expanded; disc yellow, or bluish-cinerious, margin fringed with short brown hairs, externally nut-brown; asci clavate; sporidia 8, fusiform, straight, or curved, uniseptate, or with three nuclei, $\cdot 01\text{--}\cdot 02 \times \cdot 004\text{--}\cdot 006$ mm.; paraphyses numerous, very slender.

On chips. No. 990.

Ascobolus (Ascophanus) pilosus. *Boud.*—On dog's dung. No. 954.

Ascobolus (Ascophanus) raripilus. n. s.—Gregarious, or crowded, minute, sessile, glabrous, at first globose, then hemispherical; disc convex, pale, egg-yellow, scantily clothed externally with a few, pale, septate, straight hairs; asci broadly clavate; sporidia 8, ovate, smooth, hyaline, $\cdot 025 \times \cdot 014$ mm.; paraphyses linear, simple, clavate at the summit.

On cow dung. No. 509.

Ascobolus (Ascophanus) ciliatus. *Boud.*—No. 619.

Ascobolus (Ascophanus) papillatus. *Boud.*—No. 622.

Bulgaria sarcoides. *Fr.*—No. 525.

Stictis versicolor. *Fr.*—No. 562.

ON CHÆTOPHOMA.

By M. C. COOKE.

A small group of minute fungi have undoubtedly presented themselves in the experience of most mycologists, similar, if not identical with those of the present communication. These insignificant plants have been thrown aside as unworthy of attention, because, as most probably is the case, they are not autonomous. At the outset we must confess, unreservedly, that we do not regard them in any other light than as the pycnidia, or bodies of a similar value, of some higher and unknown forms. The only good purpose which can be served by attaching names to such organisms is to afford a definite means for their identification, so that hereafter they may the more readily be referred to the species of which they are but a simple condition. Such records may in the future help to elucidate the life history of plants now imperfectly known. By themselves the species which compose such genera as *Septoria*, *Phyllosticta*, *Phoma*, *Sphæroopsis*, *Tubercularia*, &c., are of little interest or value; but when we are enabled to associate them undoubtedly with other fungi, as simple conditions, or accessories, they acquire a value in proportion as they lose their distinctive name. With this explanation we may proceed to the bodies in question.

Somewhat allied to *Phoma*, but quite distinct from that genus, there are a number of *species*, as we shall for the present designate them, which possess a delicate membranaceous perithecium, sometimes globose, sometimes flask-shaped and sometimes elliptical or cylindrical, which are entirely superficial, that is, not immersed in any matrix, but usually seated upon, or amongst an intricate byssus of ramifying threads. It is very usual to meet them in company with some *Cladosporium* or *Macrosporium*. It is true that they may prove to be the pycnidia of the species of *Sphæria* of which the *Cladosporium*, or the *Macrosporium*, are the conidia; but it will not serve the purposes of science to guess at their function until the facts are established, since there is even a possibility that they may be parasites upon the threads with which they are found associated.

These membranaceous perithecia contain a very large number of minute simple spores which are expelled, at least in some instances, in a long tendril from the apex, either through a cleft or generally a pore or ostium. In some features they resemble very minute species of *Phoma*, but they are certainly not good members of that genus, they form a very natural group in themselves with various features in common, and would constitute a far more natural and distinct genus than many of the new genera of *Sphæriacei* now in vogue. *Coniothyrium* is another genus for which they have some affinity, but, as that genus is now being understood, they would

scarcely find a place in it. *Aposphæria* is a genus which was constituted to receive such species of carbonaceous *Phoma* as in time became superficial by the falling away of the cuticle; hence these species have less reason for being associated with *Phoma*, because they are always superficial, and have as distinct a byssoid stroma as the majority of species of *Asteroma*.

Temporarily, therefore, and for the purposes of identification, we propose the association of these simple forms under the name of *Chætophoma*, so that each may have a name by which it may be spoken or written about, and consequently aid in referring them to their proper position, whenever that may be discovered.

Chætophoma. *Gen. nov.*

Perithecia membranacea, minutissima, superficialis, intra hyphis intricatis plerumque nidulans, spermatis minimis, continuis, hyalinis saepe ovalibus vel ellipsoideis. Principally foliicolous.

The enumeration of some of the forms which we would propose for insertion under this name will serve to illustrate better than a mere technical description, which is necessarily somewhat lax, the features which a number of these minute forms have in common.

A. Perithecia subglobose.

Chætophoma ilicifolia. *Cke.*

Hypophylla, fuliginea, maculaeforma. Hyphis byssinis ramulosis, intricatis, brunneis, ramulis adscendentibus, cladosporioideis. Peritheciis brunneis, globosis (.07 mm. diam.) sparsis. Sporibus ellipticis, vel ovalibus, hyalinis (.004 × .0025 mm.).

On leaves of *Ilex opaca*. S. Carolina. Rav. (No. 2567.)

Forming smoky spots on the under surface of the leaves. The minute perithecia are seated amongst the threads of a species of *Cladosporium*.—Pl. 118, fig. 3.

Chætophoma quercifolia. *Cke.*

Hypophylla, effusa, fuliginla. Hyphis byssoideis repentibus, flexuosis, furcatis, intricatis, brunneis. Peritheciis globosis, fuscis, (.03-.04 mm. diam.), gregariis vel sparsis. Sporibus minimis, ovatis, hyalinis.

On leaves of *Quercus nigra*. U. States. S. Carolina. Rav.

The perithecia are smaller and more gregarious than in *C. ilicifolia*, and no conidia have yet been detected on the byssoid threads, which are densely interwoven.—Plate 118, fig. 1.

Chætophoma Catesbeyi. *Cke.*

(*Phoma Catesbeyi* Thum. Flora, 1878, p. 179.)

Hypophylla, fusca. Hyphis byssoideis, ramosis, intricatis, brunneis, repentibus. Peritheciis gregariis, foliorum paginam inferiorem toto occupans, subglobosis, fuscis (.025-.03 mm.) Sporibus sub-ovato globosis, hyalinis (.0015 mm.)

On leaves of *Quercus Catesbeyi*. S. Carolina. Rav. (2202).—Plate 118, fig. 2.

Chætophoma anthelmintica. *Cke.*

Epiphylla, atro-fulginea. Hyphis byssoideis repentibus, brunneis, ramulosis, ramulis conidiiferis erectis, cladosporoideis. Peritheciis globosis-depressis, brunneis ($\cdot 01$ mm.) Sporis arcte ellipticis, obtusis, hyalinis ($\cdot 007 \times \cdot 003$ mm.)

On fading leaves of *Chenopodium anthelminticum*. S. Carolina. Rav. (2088.)

In this instance the perithecia are seated amongst the threads of a *Cladosporium*.—Plate 119, fig. 5.

Chætophoma Catalpæ. *Cke.*

Hypophylla, effusa, brunnea. Hyphis byssoideis repentibus, flexuosis, ramulosis, paucis. Peritheciis globosis, brunneis ($\cdot 04\text{--}\cdot 05$ mm.). Sporis subovatis, hyalinis ($\cdot 002 \times \cdot 0015$ mm.)

On dead leaves of *Catalpa cordifolia*. S. Carolina. Rav. (2302.)—Plate 118, fig. 4.

In this species the hyphæ are not so profuse or distinct as in most of the others. In some conditions the threads are nearly obsolete, in others they constitute a *Cladosporium*, with small uni-septate spores.

B. Perithecia elongated.**Chætophoma cycadis.** *Cke.*

Hypophylla, maculæforma, sparsa, brunnea. Hyphis byssoideis ramosis, repentibus, ramulis conidiferis assurgentibus, macro sporoides. Peritheciis lagenæformibus, superne attenuatis, fuscis ($\cdot 015 \times \cdot 09$ mm.) Sporis ellipticis, hyalinis ($\cdot 005 \times \cdot 003$ mm.)

On leaves of *Cycas*. S. Carolina (2543.)

Seated amongst *Macrosporium commune*, in velvety patches on the under side of the leaves. In this species we saw the expulsion of the spores in a long continuous tendril during examination under the microscope.—Plate 119, fig. 6.

Other species have been met with, as for instance one on dead sheaths of maize (*Zea mays*); and another mixed with *Cladosporium* and *Macrosporium* on leaves of oleander, but these have not been described, as they require further investigation and study.

The species already enumerated will be sufficient to illustrate the scope of the genus, of which specimens of four will be issued in Ravenel's "American Fungi." Up to the present we have not met with any genuine European species.

The plates in illustration will be issued in a subsequent number of this journal.

Plate 118, fig. 1. *Chætophoma quercifolia*, perithecia and spores $\times 500$; fig. 2, *Chætophoma Catesbeyi*, perithecia and spores $\times 500$; fig. 3, *Chætophoma ilicifolia*, perithecia and spores, $\times 500$; fig. 4, *Chætophoma catalpæ*, perithecia and spores, $\times 500$.

Plate 119, fig. 5. *Chætophoma anthelmintica*, perithecia and spores $\times 500$; fig. 6, *Chætophoma cycadis*, perithecia and spores $\times 500$.

A PROPOSAL OF PHÆNOLOGICAL OBSERVATIONS ON MOSSES.

By WILLIAM ARNELL.

Simultaneous observations on periodical phenomena in plants and animals, or so called phænological observations, have for many years been made as well in most of the European countries, as also in North-America and even at some few stations in the Russian part of Asia. It is especially after 1842, in which year Professor Quetelet in Brussel's renowned "*Instructions pour l'observation des phénomènes périodiques*"* were issued, that a very lively interest has been taken in these phenomena. Many and important are the laws of nature that have been discovered by means of the stock of comparable phænological observations thus collected to the greatest part after the above-mentioned year. As for plants these observations have, however, hitherto extended only to phanerogams. It has even, strangely enough, as for what I know, only once before been proposed, to wit by doctor A. Pokorny,† to extend the observations also to cryptogams; but these summons appear to have led to no purpose, probably because the proposal was made in too vague terms. It must, however, of course be as important to examine cryptogams as phanerogams with respect to their phænological relations. Especially it would be very important to find whether the laws, existing for phanerogams, are followed also by cryptogams, or, if this be not the case, what differences these may display in this respect. It is from these reasons, that, to the readers of *Revue Bryologique*, I renew the summons, already issued by doctor Pokorny, as far as they refer to mosses, and summon to simultaneous phænological observations on these plants, the more so as mosses, on account of the wide distribution of some of their species, are still better adapted to such observations than phanerogams; and, because in observations of this kind it is necessary that all observers agree on a common plant, lest the observations of different observers may become fully comparable to each other, I dare at the same time give an account of the plan according to which I have believed that these observations would be arranged with the greatest profit.

As it is especially the blooming and the fructification that have been made the objects of observation in phanerogams, it is highly desirable that the same phenomena were observed also in mosses. The *blooming* is, to be sure, not fully so well adapted to phænological observations in mosses, as in phanerogams, because it is only through very toilsome and time-wasting researches by

* In "Bulletins de l'Acad. Royale des Sciences, etc., de Bruxelles," tome 9.

† A. Pokorny: "Ansichten über Beobachtungen an Kryptogamen (in Jahrbücher der K. K. Central-Anstalt für Meteorologie," etc., in Wien. Band 8. Auhang).

means of the microscope possible to determine the precise day at which a moss begins to bloom ; I believe, however, that it will prove to be of such importance to learn the time of blooming of different mosses in different parts of the world,* that I, nevertheless, dare propose observations on the blooming of mosses : but as it would be connected with too much labour to fix the days of blooming as nicely in mosses, as in phanerogams, we must perhaps in mosses be contented with dates that denote the day of blooming only approximately, which dates are, on the contrary, very easily won, as I know from my own experience. For getting such dates I have found it connected with the least labour to collect small specimens of the moss that I desired to examine from different parts of a year ; for instance, one specimen from each fortnight, and afterwards to examine all the collected specimens at once in the winter. It is, however, of course even only in the first year in which these observations are made in a station, that it is necessary to collect specimens from *every* season, as in following years it is clear from the researches of preceding years about which time the blooming begins, on which account it is then sufficient to collect specimens for examination only from about this time. The *fructification* is, on the contrary, much better adapted to phænological observations in mosses, at least in stegocarpous mosses, in which the time of the detachment of the lids is so easily observed, than in phanerogams, on which account I do not think any further pleading my proposing observations on this phenomenon necessary.

Both the above-mentioned kinds of phenomena, the blooming and the fructification, I think, are most properly to be observed in mosses, as is also most commonly the case in phanerogams at their beginning ; this stage of formation being considered to have entered at the blooming, when in a species in at least two flowers only one or two archegonia are opened, while, on the contrary, the other archegonia are still closed and uncoloured, or, if archegonia are not accessible, when in each of at least two flowers only one or two antheridia are opened and uncoloured or brown, while, on the contrary, all the other antheridia are still closed. In determining the blooming-time, however, if archegonia are at hand, these ought in the first place to be consulted ; because we are less subjected to errors when determining the blooming-time of a moss according to archegonia than according to antheridia. Especially I dare warn observers of believing the blooming to have entered in a moss only because its antheridia may appear fully developed, if not at the same time any antheridium is opened, as antheridia may often appear fully developed many months before their being opened, and before their antherozoids begin to swarm. The fructification I have, on the contrary, believed may be considered to have begun when in a species about 5-10 lids are *in the nature* (not on dried

* In this respect I besides refer to the summons already before issued by E. Roze in *Revue Bryologique*, 1874, pag. 2-3.

specimina in collections, in which, as every bryologist knows, the lids are detached earlier than in nature) detached from their fruits.

The above proposed observations I have thought it best to limit to only a small number of species, because many a one would be deterred from undertaking a greater number of observations, as being too toilsome, and because it is better to get numerous dates of few species, than few dates of many species. Besides, I have, in making choice of the mosses, here underneath proposed as objects of observing, tried to get mosses :

That through their wide distribution, may be common to observers in the most distant countries ;

That are easily recognised lest they may not by any observer be confounded with other species ;

That I have found to have a more limited time of their blooming and fructification ;

That, as far as possible, represent very different parts of the year, as it is important to examine what variations the phænological laws are subjected to according to different seasons ;

That their blooming and fructification are at least in Sweden contemporary with many kindred species, by which means at the same time, as the time of blooming and fructification in different regions of the world become known in the proposed species, this time is at least approximatingly indicated also to their contemporaries in Sweden, as mosses that are contemporary in Sweden, must be supposed with very great probability to be contemporary also in other countries ; or finally

The blooming and fructification of which in Sweden exhibit any extraordinary peculiarities ; as for which it were interesting to find whether they exist also in other countries. Among the mosses that I have chosen chiefly from the last reason I dare in the first place call attention to *Dicranella cerviculata* and *varia*, the former of which, as well as also *D. heteromalla*, *subulata*, and *curvata*, blossoms in Sweden about the 1st of September, and ripens its fruits first 16-19 months after the blooming, whereas *D. varia*, as well as the remaining Swedish species of *Dicranella*, blossoms about midsummer, but ripens its fruits already 6-8 months after the blooming : to *Hypnum crista-castrensis*, that blossoms in Sweden in the former half of August, and requires 16-21 months for the formation of its fruits, this species and *Hypnum purum* thus being the only pleurocarpous mosses in Sweden that require more than a year for the formation of their fruits ; to *Aulacommon palustre*, *Tetraphis pellucida*, *Polytrichum commune* and *piliferum* that require in Sweden at least 13 months for the formation of their fruits ; to *Dicranum undulatum* and *fuscescens* that require even 17 months for the formation of their fruits, and, besides, bloom at different seasons in different parts of the Scandinavian peninsula, in the midst of Sweden a little before the 1st of August, in more northern parts of Norway in June, etc.

The mosses that on account of one or another of the above-mentioned principles, I have considered most adapted to the purpose in question, and that I on that account dare propose to the readers of the *Revue Briologique* for observation are the following, that I have arranged as well in the order in which they blossom as also in the order in which they ripen their fruits at Hernoesand (at 15° 30' east. long. from Paris, 62° 30' n. lat.) in the midst of Sweden, from which arrangement every reader will, to be sure, immediately perceive that these phenomena at Hernoesand and in the place to the phænological relations of which the reader may be best acquainted, belong to very different times.

Blooms at Hernoesand.

Eurhynchium strigosum (Hoffm.)	about the 25	of May.
Pylaisia polyantha (Schreb.)	„ 10	June.
Hypnum cupressiforme L.	„ „	„
Tetraphis pellucida (L.)	„ „	„
Aulacomnion palustre (L.)	„ 20	„
Dicranella varia (H.)	„ „	„
Mnium punctatum L.	„ „	„
Atrichum undulatum (L.)	„ 1	July.
Barbula unguiculata H. (*)	„ „	„
Webera cruda (Schreb.)	„ „	„
Polytrichum piliferum Schreb.	„ „	„
— commune L.	„ „	„
Mnium cuspidatum H.	„ „	„
Grimmia apocarpa (L.)	„ 5	„
Hedwigia ciliata (Dicks.)	„ „	„
Ceratodon purpureus (L.)	„ „	„
Hypnum Schreberi Willd.	„ „	„
Hylocomium triquetrum (L.)	„ „	„
— splendens (H.)	„ 15	„
Bartramia pomiformis (L.)	„ „	„
Barbula ruralis (L.)	„ 25	„
Pottia truncata L.	„ „	„
Dicranum undulatum Willd.	„ „	„
— fuscescens Turn.	„ „	„
Phinolotis fontana (L.)	„ 1	August.
Brachythecium salebrosum (Hoffm.)	„ 5	„
Hypnum incurvatum Schrad.	„ „	„
— crista-castrensis L.	„ 15	„
— cordifolium H.	„ „	„
— cuspidatum L.	„ „	„
Funaria hygrometrica (L.)	„ 1	September.
Plagiothecium denticulatum (L.)	„ „	„
Dicranella cerviculata (H.)	„ „	„

(*) The time of blooming and fructification of this species, that is not found at Hernoesand, is given according to specimina collected at Trondhjem, in Norway, which town is but little northlier than Hernoesand.

<i>Ripens its fruits at Hernoesand.</i>			
Atrichum undulatum (L.)	about the 1	of May.	
Pottia truncata L.	" "	"	
Dicranella cerviculata (H.)	" "	"	
Barbula unguiculata H.	" "	"	
Hypnum crista-castrensis L.	" "	"	
Pylaisia polyantha (Schreb.)	" 10	"	
Dicranella varia (H.)	" "	"	
Hylocomium triquetrum (L.)	" "	"	
Hypnum Schreberi Willd.	" "	"	
— cupressiforme L.	" "	"	
Brachythecium salebrosum (Hoffm.)	" "	"	
Hedwigia ciliata (Dicks.)	" "	"	
Eurhynchium strigosum (Hoffm.)	" 20	"	
Grimmia apocarpa (L.)	" "	"	
Mnium punctatum L.	" 1	June.	
Hylocomium splendens (H.)	" 10	"	
Mnium cuspidatum H.	" 20	"	
Ceratodon purpureus (L.)	" 1	July.	
Bartramia pomiformis (L.)	" "	"	
Hypnum cordifolium H.	" 7	"	
— cuspidatum L.	" "	"	
Barbula ruralis (L.)	" "	"	
Polytrichum piliferum Schreb.	" 15	"	
Tetraphis pellucida (L.)	" "	"	
Webera cruda (Schreb.)	" "	"	
Philonotis fontana (L.)	" "	"	
Aulacomnium palustre (L.)	" 25	"	
Funaria hygrometrica (L.)	" 1	August.	
Polytrichum commune L.	" "	"	
Hydnum incurvatum Schrd.	" "	"	
Plagiothecium denticulatum (L.)	" 1	September.	
Dicranum undulatum Willd.	" 15	October.	
— fuscescens Turn.	" "	"	

ARNELL.

AUTUMNAL GATHERINGS.

HEREFORD —The annual meeting of the Woolhope Club is fixed for the week from September 30th to October 5th.

EDINBURGH.—The fourth annual Conference of the Cryptogamic Society of Scotland will commence at Edinburgh on October 7th, and continue through the following days. On Monday, by permission of the Regius Keeper, Professor Balfour, President of the Society, a general meeting will be held in the class-room, at the Royal Botanic Garden, at 1 p.m. The President will deliver an address, and several papers will be read. In the evening the

annual dinner will take place at the Albert Hotel, Hanover Street. On Tuesday, 8th October, excursion to the valley of the Esk, from Waverley Station, 10.15 a.m. On Wednesday, 9th October, exhibition of Fungi in the Herbarium Hall, at the Royal Botanic Garden; open from 1 p.m. to 4 p.m. Any communications as to the meeting may be sent to Mr. Jno. Sadler, Royal Botanic Garden, Edinburgh, the Society's Local Secretary and Treasurer.

RAVENEL'S AMERICAN FUNGI.

By M. C. COOKE.

(Continued from Vol. vi, p. 146).

Leptostroma durissimum. Cke.

Gregaria. Peritheciis atris, scutatis, irregularibus, vel confluentibus, durissimis; sporis linearibus, obtusis ($\cdot 008$ mm. long).

On pine leaves. Aiken, S. Car. (2433).

Sacidium symploci. Cke.

Epiphyllum. Peritheciis punctiformibus, atris, scutatis, gregariis; sporis subglobois, hyalinis ($\cdot 004 \times \cdot 003$ mm.).

On leaves of *Symplocos tinctoria*. Aiken, S. Car. (1600).

Phoma Nyssæcarpa. Cke.

Sparsum. Peritheciis epidermide tectis, vix prominulis; sporis ellipticis, hyalinis ($\cdot 007 \times \cdot 003$ mm.).

On fruits of *Nyssa*. Aiken, S. Car. (2133).

Phoma circumscripta. Cke.

Maculis exaridis, brunneo-cinctis. Peritheciis atris, nitidis; sporis ellipticis, hyalinis ($\cdot 007 \times \cdot 0025$ mm.).

On dead leaves of *Bumelia*. Darien, Georgia (2434a).

Phoma Yuccæ. Cke.

Sparsum, tectum. Peritheciis prominulis, papillatis; sporis ellipticis, utrinque nucleatis, hyalinis ($\cdot 009 \times \cdot 003$ mm.).

On *Yucca*. Aiken, S. Car. (2580, 2581).

Phoma Psoraleæ. Cke.

Peritheciis atris, punctiformibus, in maculis angulatis congestis (potius *Sphærellæ* spermogoniis); sporis minimis ($\cdot 005 \times \cdot 002$ mm.).

On leaves of *Psoralea*. Aiken, S. Car.

Phoma minutissima. Cke.

Maculis irregularibus, nigricantibus. Peritheciis semi immersis, atris, punctiformibus, congestis; sporis minimis ($\cdot 004 \times \cdot 002$ m.m.).

On leaves of *Liatris odoratissima*. Aiken, S. Car. (1920).

Sphæropsis nervisequum. *Cke.*

Peritheciis atris, hysteriiformibus, sparsis; sporis ellipticis, hyalinis ($.01-.012 \times .005$ mm.).

On veins of leaves of *Quercus Catesbeyi*. Aiken, S. Car. (2046).

Sphæropsis Gleditschiæcola. *Cke.*

Peritheciis confluentibus in pustulis erumpentibus, epidermide cinctis; sporis ellipticis, brunneis ($.018 \times .003$ mm.).

On branches of *Gleditschia*. Aiken, S. Car. (2380b).

Probably a form of *Melogramma Gleditschiæ*.

Diplodia fulvella. *Cke.*

Sparsa. Peritheciis immersis, tectis, ostiolis abbreviatis, erumpentibus; sporis ellipticis, brunneis, uniseptatis, nec constrictis ($.03 \times .014$ mm.).

On bark of *Platanus*. Aiken, S. Car. (1547).

Diplodia cupressina. *Cke.*

Sparsa. Peritheciis atris, globosis, sub-superficialibus, minute papillatis; sporis ellipticis, brunneis, uniseptatis, constrictis ($.01 \times .005$ mm.).

On foliage of *Juniperus*. Darien, Georgia (2438).

Hendersonia fissurata. *Cke.*

Gregaria. Peritheciis in lineas erumpentibus, epidermide fissuratis; sporis arcte ellipticis, brunneis, triseptatis ($.012 \times .0045$ mm.).

On bark of *Ficus*. Darien, Georgia (2399).

Staurochæta membranacea. *Cke.*

Gregaria. Peritheciis applanatis ($.08$ mm.), membranaceis, fuscis, supra hyphis septatis, furcatis, radiantibus ornatis; sporis ovalibus ($.012 \times .01$ mm.), hyalino-fuscis, vix coloratis.

On old oak galls. Aiken, S. Car. (2588).

Sphæronema Microperæ. *Cke.*

Peritheciis in pustulis *Microperæ* nidulantibus, elongatis, supra attenuatis, rectis, vel curvulis, atris; sporis arcte fusiformibus, curvulis, continuis, hyalinis ($.04$ mm. long).

On pustules of *Micropera*. Darien, Georgia (2394).

Septoria Ludwigæ. *Cke.*

Epiphylla. Maculis exaridis, rubro-cinctis; peritheciis paucis, punctiformibus (5-8) gregariis; sporis linearibus, obtusis, multinucleatis flexuosis, hyalinis ($.04$ mm. long).

On leaves of *Ludwigia*. Aiken, S. Car. (2043).

Melanconium palmarum. *Cke.*

Pustulis erumpentibus, convexis, atris, centro pallidis; sporis ovatis, atro-brunneis ($.012 \times .01$ mm.).

On *Sabal*. Darien, Georgia (2449).

Torula diversa. *Cke.*

Atra, pulvinata. Hyphis repentibus ramosis; sporis concatenate, erectis, variis, demum leniter asperulis, articulis subglobosis ($.006-.01$ mm. diam.).

On leaves of *Agave*. Darien, Georgia (2522).

Sporidesmium toruloides. *Cke.*

Effusum, atrum, mycelio brunneo repente; sporis erectis, simplicibus vel furcatis, cylindraceis, utrinque leniter attenuatis, multi-septatis ($0.7-1.5 \times 0.1$ mm.), articulis subquadratis.

On dead wood. Florida (81).

Sporidesmium translucens. *Cke.*

Effusum, fuliginereum, tenue. Sporis rectis, simplicibus, vel furcatis, cylindricis, hinc illic leniter constrictis, multi-cellulosis, pallide fuligineis, subdiaphanis ($1-1.5 \times 0.2-0.25$ mm.).

On pine logs. Aiken, S. Car. (2069).

This is at best a doubtful species.

Stilbum didymum. *Cke.*

Stipite fuligineo, glabro, basi incrassato; capitulis ovatis, pallidis; sporis elongato-ellipticis, uniseptatis, fuscis ($0.12-0.15 \times 0.05$ mm.).

On bark of *Platanus*. Aiken, S. Car. (1820).

Found growing in company with the *Stilbum* of *Sphaerostilbe gracilipes*, from which it is widely distinct.

Glæosporium Angelicæ. *Cke.*

Maculis fuscis, variis; acervulis gregariis, rotundatis, vix prominulis; sporis cylindrico-clavatis, nucleatis, demum biseptatis, hyalinis ($0.4-0.6 \times 0.08$ mm.)

On fading leaves of *Archangelica*. Aiken, S. Car. (2012).

Fusarium Yuccæ. *Cke.*, pro. tem.

On *Yucca aloifolia*. Aiken, S. Car. (2564).

Certainly the stylospores of *Nectria depauperata*, C., in conjunction with which it is described.

Campsotrichum simplex. *Cke.*

Atrum, maculæforme. Floccis simplicibus, brunneis, asperulis, sursum cirrhosis; sporis cylindraceis, rectis, vel curvulis (0.2 mm. long).

On dead leaves of *Platanus*. Aiken, S. Car. (2583).

Cercospora purpurea. *Cke.*

Epiphylla. Maculis latis, variis, purpureo-brunneis; cæspitulis erumpentibus; hyphis cæspitosis, fuligineis, cylindraceis, 2-3 septatis, pallide-fuscis ($0.5-0.6 + 0.06$ mm.).

On leaves of *Persea*. Darien, Georgia (2499).

Cercospora rubella. *Cke.*

Amphigena. Maculis effusis, rubris; hyphis in strato lanoso brunneo enatis, subfasciculatis; sporis cylindraceis, supra attenuatis, hyalinis, 1-2 septatis ($0.3-0.5$ mm.).

On *Eriogonum tomentosum*. Aiken, S. Car. (2586).

Cercospora Diodeæ. *Cke.*

Maculis orbicularibus, fuscis. Hyphis paucis, erectis, septatis, fuscis; sporis cylindraceis, gracilibus, hyalinis ($0.5 + 0.03$ mm.).

On leaves of *Diodea*. Aiken, S. Car. (2284).

Cercospora Yuccæ. Cke.

Maculis ellipticis, brunneis. Cæspitulis erumpentibus; hyphis brevissimis, fasciculatis, fuliginis; sporis cylindricis, sursum attenuatis, fuscis, 1-3 septatis (.06-.08 mm.).

On *Yucca* leaves. Darien, Georgia (2516).

Cercospora polytricha. Cke.

Hypophylla. Maculis latis, fuliginis; hyphis erectis, sparsis, multi-septatis, articulis, subquadratis, toruloideis, brunneis; sporis obclavatis, biseptatis (.03-.05 mm. long).

On leaves of *Quercus virens*. Aiken, S. Car. (2417).

Macrosporium Nerii. Cke.

Effusum, atrum, velutinum. Hyphis repentibus, dichotomis; ramulis assurgentibus; sporis clavatis, stipitatis, multicellulosis, fuliginis (.08 + .015 mm.).

On Oleander leaves. Darien, Ga. (2497, 2348).

Dendryphium Arundinariæ. Cke.

Atrum, effusum. Hyphis erectis, opacis, simplicibus, vel sursum breviter furcatis, ad basi incrassatis, corticatis; sporis clavatis, concatenatis, brunneis, 4-10 septatis, constrictis (.06-.08 + .01-.012 mm.).

On *Arundinaria*. Darien, Ga. (2509).

A much coarser species than *D. Ellisii*; chiefly confined to the nodes, which it surrounds as with a black velvety band.

Torula maculans. Cke.

Late effusa, atra. Hyphis paucis repentibus; sporis in ramulis brevibus concatenatis, articulis dissilientibus, subglobosis (.004 mm. diam.).

On *Yucca* leaves. Darien (2569).

Phyllosticta Batatas. Cke.

(=*Depazea Batatas*, Thümen.)

On leaves of *Convolvulus batatas*. Aiken.

Phoma longisporum. Cke.

(=*Leptothyrium longisporum*, Thümen.)

On twigs of *Vitis æstivalis*. Aiken (2605).

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Grevillea,

A QUARTERLY RECORD OF CRYPTOGAMIC BOTANY
AND ITS LITERATURE.

NEW JERSEY FUNGI.

By M. C. COOKE, AND J. B. ELLIS.

(Continued from page 10.)

Næmatelia encephala. Fr.

On bark. No. 3013.

Comatricha typhina. R.

On rotten *Nyssa*. No. 3034.

Lamproderma physarioides. A. & S.

On dead wood. No. 3035.

Sacidium Pini. Fr.

On pine leaves. No. 2908.

Leptostroma petiolorum. C. & E.

Sparsa, orbicularis, scutellata, nigra; sporis minimis, linearibus, rectis, hyalinis (·005 mm. long).

On petioles of *Ailanthus*. No. 2984.

Phoma glandulosum. Cke.

On petioles of *Ailanthus*, in company with the foregoing. No. 2984.

Cryptosporium Nyssæ. C. & E.

Erumpens. Pustulis tectis, demum epidermide laceratis, atris; sporis lanceolatis, hyalinis, nucleatis, rectis (·02-·022 × ·005).

On branches of *Nyssa*.

Very similar to *Cryptosporium coronatum*, Fekl., but neither of them good species of *Cryptosporium*. No. 3000.

Ceuthospora foliicola. Rabh.

On *Kalmia latifolia*. No. 3019.

Cryptosporium epiphyllum. C. & E.

Maculis orbicularibus, fuscis. Pustulis 1-3, obscuriore, convexis; sporis fusoides, lunatis, hyalinis, utrinque acutis (·03 mm. long).

On fading leaves of *Castanea*.

In some respects resembling a *Fusarium*, the spots pass to both sides of the leaf, but spores are developed only on the under surface. Professor Saccardo considers this a species of *Septoria*; but as we can trace no distinct perithecia, we prefer to retain it in the above genus. No. 3077.

Sphæropsis lanceolatum. *C. & E.*

Sparsum, epidermide nigrofacta tectum. Peritheciis brunneis, sub-membranaceis, poro pertusis; sporis lanceolatis, hyalinis, rectis, granulis repletis ($\cdot 03 \times \cdot 007$ mm.).

On *Asparagus* stems.

No. 3011.

Hendersonia trimera. *Cke.*, in "Nuova Giorn. Bot. Ital."

On *Fimbristylis autumnalis*.

No. 3063.

Septoria Kalmiæcola. *Curt.*

(*Depazea Kalmiæcola*, Schw.)

On leaves of *Kalmia*.

No. 3020.

Dinemasporium patellum. *C. & E.*

Sparsum. Peritheciis demum superficialibus, atris, cupulæ-formibus; margine incurvatis, extus flexuoso-pilosis; sporis fusiformibus, curvulis, utrinque attenuatis, 3-4 nucleatis ($\cdot 025 \times \cdot 03$ mm. long, sine appendiculis).

On herbaceous stems.

Very similar in habit and size to *Excipula recurva*, Ger., but the spores in that species are rather smaller, and do not appear to be aristate. It is doubtful whether the separation of *Excipula* from *Dinemasporium*, merely on account of this slight feature in the spores, is not too artificial. The present species has evidently more natural affinity with *Ex. recurva*, than that species with *Excipula strigosa*, and yet they are placed in different genera.

No. 2982.

Vermicularia compacta. *C. & E.*

On Dahlia stems.

No. 2988.

Torula bigemina. *C. & E.*

Brunnea, tenue effusa. Floccis multiseptatis (7-9), æqualibus, fuscis, binis conjunctis, articulis quadratis, persistentibus.

On rotten wood.

No. 3010.

Torula sphæriæformis. *C. & E.*

(*Torula abbreviata* var. *sphæriæformis*, B. & Br.?)

Sphæriæformis, sparsa. Floccis fasciculatis, multiseptatis, hyalinis; articulis subglobosis, connatis.

On oak limb.

The articulations are twice as numerous as in the variety described by Berkeley, and can scarcely be retained as a form of *Torula abbreviata*, Corda.

No. 3048.

Torula herbarum. *Lk.*

On potato stems.

No. 3008.

Coryneum Kunzei. *Corda.*

On white oak.

No. 3078.

Epochnium macrosporoideum. *B. & Br.*

On rotten maple.

No. 3029.

Fusarium diplosporum. *C. & E.*

Rosenum, pulvinatum. Sporis aliis fusiformibus, utrinque acutis, arcuatis, nucleatis, demum leniter 3 septatis ($\cdot 04$ mm. long), aliis ellipticis, uniseptatis ($\cdot 018 \times \cdot 008$ mm.).

On potato stems.

No. 2983.

- Fusarium roseum.** *Lk.*
On wormwood. No. 3070.
- Fusisporium pallido-roseum.** *Cke.*
On *Phytolacca*. No. 3007.
- Epicoccum Duriaëanum.** *Mont.*
On leaves of *Orontium*. No. 3041.
- Polyactis streptothrix.** *C. & E.*
Fuliginea, effusa. Hyphis repentibus, ramosis; ramis assurgentibus, divisis, intricatis, crenulato-flexuosis; capitulis breviter ramulosis, ramulis rotundatis; sporis globosis (.018 mm.) in apicibus congestis.
On leaves of *Orontium*.
The threads have the appearance of a coarse species of *Streptothrix*, but the spores, and their mode of attachment, are those of a *Polyactis*. No. 3040.
- Oidium compactum.** *C. & E.*
On bark.
Probably only a state of *Ægerita*. No. 2992.
- Illosporium pallidum.** *C.*
On *Zea Mays*. No. 3069.
- Sphæridium citrinum.** *Sacc.*
On fir branches. No. 2920.
- Graphium stilboideum.** *Corda.*
Apparently this species, but not in good condition.
On herbaceous stems. No. 2986.
- Dactylium roseum.** *Berk.*
On Holly bark. No. 3030.
On *Lactuca*. No. 3027.
- Cladosporium delectum.** *C. & E.*
On leaves of *Magnolia*. No. 3038.
- Menispora glauco-nigra.** *C. & E.*
Effusa, atro-brunnea, subvelutina. Hyphis erectis, tenuibus, septatis, fuscis, supra hyalinis; sporis acrogenis, fasciculatis, cylindricis, curvulis, utrinque rotundatis, hyalinis (.02 × .004 mm.).
On rotten *Magnolia*. No. 3047.
- Macrosporium inquinans.** *C. & E.*
Effusum, atrum, velutinum. Hyphis brevibus, simplicibus; sporis fuliginis, elavatis, hetero-divisis, fortissime constrictis (.04-.05 × .015-.02 mm.), cellulis subglobosis.
On stems of *Lactuca*. No. 3032.
- Macrosporium atrichum.** *C. & E.*
Tenue effusum, griseum. Hyphis obsoletis; sporis ovatis, vel ellipticis, 2-3 septatis, hinc illic divisis, late-brunneis (.02-.03 × .01-.015 mm.).
On stems of *Lactuca*. No. 3015.
- Macrosporium commune.** *Rabh.*
On *Chenopodium*. No. 3025.
On *Helianthus*. No. 3024.
On *Asparagus*. No. 3006.

Mystrosporium orbiculare. *C. & E.*

Hypophyllum, orbiculare, atrum. Sporis clavatis, 5-7 septatis, hinc illic divis, fuliginis ($\cdot 04 \times \cdot 02$ mm.) in stipitibus septatis longe productis ($\cdot 01$ mm.).

On leaves of *Ilex*. No. 3043.

Dendryphium Ellisi. *Cke*

On rotten maple. No. 3072.

Cercospora pulvinula. *C. & E.*

Punctiformis, hypophylla. Hyphis brevissimis, in cæspitulis dense congestis, subolivaceis; sporis cylindricis, leniter 1-2 septatis, hyalinis ($\cdot 02$ - $\cdot 035$ mm. long).

On holly leaves. No. 3042.

Helminthosporium interseminatum. *B. & Rav.*

(=*Helminthosporium ramineum*, B. & C., γ *Dendryphium nodulosum*, Sacc., and *Helminthosporium nodulosum*. Gerard.)

On *Phytolacca* stems. No. 3046.

Helminthosporium brachytrichum. *C. & E.*

Smaller and younger form.

On maple. No. 3073.

Helminthosporium fusiforme. *Corda.*

On rotten wood. No. 3009.

Helminthosporium persistens. *C. & E.*

On alder. No. 3031.

Mucor caninus. *Pers.*

On mouse dung. No. 3036.

Mucor mucedo. *Linn.*

On sweet potato. No. 3033.

Peziza acetabulum. *Linn.*

On the ground. No. 3028.

Peziza (Sarcoscypha) scutellata. *Linn.*

On rotten wood. No. 2985.

Peziza (Dasyscypha) acerina. *C. & E.*

Hypophylla, sparsa, punctiformis; cupulis sessilibus, tenuibus, fuscis ($\frac{1}{5}$ mm.); margine albopileatis; ascis subclavatis; sporidiis linearibus ($\cdot 006$ mm.).

On leaves of maple.

Marginal hairs minutely rough. No. 3045.

Peziza (Tapesia) fusca. *P.*

On *Vaccinium*. No. 3014.

Peziza (Moll) tenella. *C. & E.*

Hypophylla, sparsa. Cupulis tenuibus, hemisphericis, demum applanatis (0.15 - 0.2 mm.) pallide corneis; margine albidis; ascis clavatis; sporidiis linearibus, rectis ($\cdot 005$ mm.).

On fronds of *Osmunda*. No. 3023.

Patellaria lignyota. *Fr.*

On bark of *Nyssa*. No. 3022.

Cenangium acuum. *C. & Pk.* (**Peziza pinastri**, *C. & Pk.*)

Additional specimens convince us that this belongs to *Cenangium* and not to *Peziza*.

On pine leaves. No. 3004.

Hysterium (Lophodermium) arundinaceum var. **gramineum**.On sheaths of *Phleum*. No. 3052.**Sporomega degenerans**. *Duby*.On *Vaccinium corymbosum*. No. 2987.**Melogramma ambiguum**. *S*.On *Rhus*. No. 3076.**Valsa stellulata**. *Fr*.

On apple branches. Nos. 2998, 2990.

Valsa thelebola. *Fr*.On *Alnus*. No. 3049.**Diatrype Badhami**. *Curr*.On *Prinos glaber*. No. 2999.**Sphæria (Ceratostoma) barbirostris**. *Dufour*.

On rotten wood. No. 3018.

Sphæria (sub-tectæ.) bisphærica. *C. & E*.Semi-immersa. Peritheciis atris, papillatis, hinc illic gregariis; ascis cylindraceis; sporidiis uniseriatis, ellipticis, uniseptatis, medio constrictis, brunneis (0.12×0.07 mm.).

On decorticated apple limbs. No. 3068.

Sphæria (sub-tectæ.) subcutanea. *C. & E*.Semi-immersa, sparsa. Peritheciis atris, papillatis; ascis clavatis; sporidiis fusiformibus, rectis vel curvulis, 5 septatis, medio constrictis, hyalinis (0.04×0.05 mm.).

On decorticated pear twigs.

The third cell of the sporidia slightly swollen. No. 3064.

Sphæria (obtectæ) viscosa. *C. & E*.

On apple. No. 3005.

Sphæria (obtectæ) sublanosa. *Cke*.Sporidia hyaline, cylindrical or subfusiform, obtuse, straight or slightly curved (0.035×0.005 mm.), constricted but slightly in the centre, nucleate, at length faintly triseptate.On old branches of *Andromeda*.

The same species has been found on old fallen branches in England. No. 3067.

Sphæria (obtectæ) phomopsis. *C. & E*.Peritheciis numerosis, minimis, membranaceis, brunneis, sub-applanatis, epidermide tectis; ascis clavatis; sporidiis naviculaeformibus, hyalinis, nucleatis ($0.12-0.14 \times 0.06$ mm.).On twigs of *Desmodium*.

The sporidia were scarcely mature. It is not improbable that ultimately they are uniseptate. No. 3074.

Sphæria (obtectæ) distributa. *C. & E*.Sparsa. Peritheciis atris, prominulis, epidermide nigrofacta tectis; ascis clavatis; sporidiis biseriatis, lanceolatis, utrinque rotundatis, triseptatis, medio constrictis, brunneis ($0.028 + 0.009$ mm.).On small twigs of *Desmodium*.Found in company with another *Sphæria*, but the specimens did not afford sufficient material for description. No. 3065.

Sphæria (caulicolæ) adelphica. C.

Apparently the same species as has been found in England on herbaceous plants.

On *Phytolacca*.

The uniseptate brown spores measure $\cdot 016 \times \cdot 0065$ mm.

No. 2989.

Sphæria (caulicolæ) eriophora. Cke.

On *Amaranthus*.

No. 3075.

Sphæria (caulicolæ) subexserta. C. & E.

Sparsa, tecta. Peritheciis atris; ostiolis elongatis, obtusis, exsertis; ascis subclavatis; sporidiis arcte ellipticis, biseriatis, uniseptatis, hyalinis ($\cdot 012\text{--}\cdot 014 \times \cdot 005$ mm.).

On *Mulgedium*.

Allied to *S. cataricæ*, C. & E., but the spores are smaller.

No. 3060.

Sphæria (caulicolæ) Ogilviensis. B. & Br.

On *Erigeron*.

No. 3053.

On *Bidens*.

No. 3054.

On *Aster*.

No. 3055.

Sphæria (Raphidospora) rubella. P.

On potato.

No. 3058.

On tomato.

No. 3057.

Sphæria (Raphidospora) anguillida. C. & E.

On aster.

No. 3003.

On herb stems.

No. 3056.

Perithecium very hard, almost like a *Sclerotium*.

Sphæria (Pleospora) herbarum. Pers.

On *Lactuca*.

No. 3061.

On *Daucus*.

No. 3062.

Sphæria (Foliicolæ) Ilicis. Schl.

On holly leaves.

No. 3044.

Sphærella Dahlia. C. & E.

Sparsa. Peritheciis membranaceis, brunneis, epidermide tectis, poro pertusis; ascis clavatis; sporidiis biseriatis, ellipticis, uniseptatis, hyalinis ($\cdot 012 \times \cdot 004$ mm.).

On stems of *Dahlia* with *Vermicularia*.

No. 2988.

Sphærella Gaultheria. C. & P.

Epiphylla. Maculis orbicularibus, albidis, purpureo-cinctis; peritheciis punctiformibus, circinatis; ascis clavatis; sporidiis lanceolatis, biseriatis, uniseptatis ($\cdot 015\text{--}\cdot 018 \times \cdot 004$ mm.).

On leaves of *Gaultheria*.

No. 3012.

N.B.—We are informed that the price of Ellis's Specimens of North American Fungi is twenty-eight shillings for each century, of which the first is published.

RAVENEL'S AMERICAN FUNGI.

By M. C. COOKE.

(Continued from Vol. vii., pp. 35.)

Agaricus (Inocybe) maritimus. *Fr.*
On the ground in damp places. Georgia (2416).

Agaricus (Amanita) vaginatus. *Fr.*
On the ground. Aiken, S. Car. (2632).

Agaricus (Clitocybe) laccatus. *Fr.*
On the ground. Aiken, S. Car. (2427).

Schizophyllum commune. *Fr.*
On trunks. Aiken, S. Car.

Xerotus lateritius. *B. & C.*
On bark. Darien, Georgia.

Lentinus Lecomtei. *Fr.*
On trunks. Darien, Georgia (2511).

Lentinus Ravenelii. *B. & C.*
On logs. Darien, Georgia (2452).

Boletus pachypus. *Fr.*
On the ground. Aiken, S. Car. (2633).

Polyporus arcularius. *Fr.*
On the ground. Darien, Georgia (2439).

Polyporus cupulæformis. *B. & C.*
On bark of *Rhus*. Darien, Georgia (2537, 2365).

Polyporus versicolor. *Fr.*
On trunks. Darien, Georgia (2515).

Polyporus barbatulus. *Fr.*
On *Juniper*. Darien, Georgia (2536).

Merulius ambiguus. *B. & Rav.*
On logs. Darien, Georgia (2513).

Irpex tabacinus. *B. & C.*
On oak. Darien, Georgia (2493).

Craterellus lutescens. *Fr.*
On sandy soil. Aiken, S. Car. (2288).

Stereum versicolor. *Fr.*
On logs. Darien, Georgia (2440).

Stereum albobadium. *S.*
On oak. Darien, Georgia (2550).

Stereum Curtisii. *B.*
On logs. Darien, Georgia (2549).

Stereum subpileatum. *B. & C.*
On logs. Darien, Georgia (2451).

Stereum sulfureum. *Fr.*
On trunks. Darien, Georgia (2426).

Hymenochæte crocata. *Lev.*
On oak. Aiken, S. Car. (1721).

Hymenochæte rubiginosa. *Lev.*
On *Quercus virens*. Darien (2457, 2469).

- Solenia anomala.** *P.*
On *Quercus*. Darien, Georgia (2531).
- Cyphella villosa.** *P.*
On *Vitis*. Aiken, S. Car. (2608).
- Cyphella virgultorum.** *C.*
On *Vitis*. Aiken, S. Car. (2608).
- Cyphella cupulæformis.** *B. & Rav.*
On Juniper. Darien, Georgia (2480).
- Crinula paradoxa.** *B. & C.*
On *Quercus virens*. Darien, Georgia (2500, 2503).
- Tremella mesenterica.** *Fr.*
On branches. Darien, Georgia.
- Physarum leucopus.** *Lk.*
On oak. Darien, Georgia (2406).
- Physarum leucophæum.** *Fr.*
On *Yucca*. Aiken, S. Car (2565, 2598, 2611).
- Physarum Schumacheri.** *Spr.*
On twigs, &c. Aiken, S. Car. (2619).
- Leptostroma filicinum.** *Fr.*
On *Pteris*. Darien, Georgia (2432).
- Leptostroma litigiosum.** *Desm.*
On *Osmunda*. Darien, Georgia (2431).
- Phlyctæna arcuata.** *B. & C.*
On *Rumex*. Aiken (2071).
- Coniothyrium concentricum.** *Sacc.*
On *Yucca*. Aiken, S. Car. (2570, 2580).
Referred also to *Phoma* and *Macroplodia*.
- Coniothyrium epiphyllum.** *Cke.*
On *Quercus Catesbeyi*. Aiken (1921).
- Phoma glandicolum.** *Desm.*
On acorns of *Quercus virens*. Darien, Georgia (2414).
- Ceuthospora foliicola.** *Lib.* var. **Euonymi.**
On *Euonymus Japonica*. Aiken (2571).
- Ceuthospora Cookei.** *Thum.*
On *Persea*. Aiken (2188).
- Diplodia Hederae.** *Desm.*
On ivy twigs. Aiken, S. Car. (2623).
- Diplodia Rosæ.** *Fr.*
On rose. Aiken, S. Car. (2625).
- Diplodia vulgaris.** *Fr.*
On branches. Aiken, S. Car. (2627).
- Diplodia Zeæ.** *Schw.*
On *Zea Mays*. Aiken, S. Car. (2631).
- Diplodia Ravenelii.** *Cke.*
Hypophylla. Gregaria, vel sparsa; peritheciis atris, convexis, semi-immersis; sporis elongato-ellipticis, brunneis ($.02 \times .008$ mm.).
On leaves of *Magnolia*. Aiken, S. Car. (2634).

Pestalozzia stellata. *B. & C.* var. *Nerii*, *Cke.*
On *Oleander*. Darien, Georgia (2498).

Pestalozzia pezizoides. *Not.*
On *Vitis æstivalis*. Aiken (2562, 2561).

Pestalozzia Castagnei. *Desm.*
On acorns. Darien, Georgia (2414).

Discosia artocreas. *Fr.*
On leaves of *Platanus*. Aiken (2584).
On leaves of *Cratægus*. Aiken (2595).

Micropera drupacearum. *Ler.*
On cherry. Darien, Georgia (2393).

Sphæronema spina. *B. & C.*
On *Fraxinus*. Darien, Georgia (2464).

Vermicularia rectispora. *Cke.*
On petioles of *Mellu*. Aiken (2388).

Vermicularia dematium. *Fr.*
On *Opuntia*. Charlotte Harbour, Fla. (2556).

Cryptosporium coronatum. *Fekl.*
On *Populus angulata*. Aiken (2048).

Cytispora ocellata. *Fekl.*
On *Amygdalus*. Aiken, S. Car. (2553).

Dendrina Diospyri. *B. & C.*
On leaves of *Diospyros*. Aiken, S. Car. (2628).

Septoria speculariæ. *B. & C.*
On *Specularia perfoliata*. Darien (2400).

Ræstelia aurantiaca. *Ph.*
On *Cratægus*. Aiken, S. Car. (9577).

Ræstelia sp. (spermogonia).
On *Cratægus* (15).

Peridermium corticolum. *Lk.*
On *Pinus taeda*. Darien, Georgia (2445).

Peridermium orientalis. *Cke.*
On *Pinus australis*. Aiken, S. Car. (2552).

Graphiola phœnicis. *Poer.*
On *Bambusa*? Fernandina, Fla. (132).

Trichobasis compositarum. *Ler.*
On leaves. Catoosa, Fla. (Austin).

Trichobasis rubrum. *Bon.*
On *Phaseolus*. Aiken, S. Car. (2060).

Trichobasis rubigo. *Ler.*
On rye. Darien, Georgia (2397).

Trichobasis Polygonorum. *Ler.*
On *Polygonum acre*. Aiken, S. Car.

Puccinia Gonolobi. *Rav.*
On *Gonolobus*. Aiken, S. Car. (2610).

Puccinia Amorphæ. *Curt.*
(*Uredo* form.) Aiken, S. Car. (2011).

Puccinia caricina. *D.C.*
On *Cyperus*. Aiken, S. Car. (2092).

Puccinia graminis var. **Sorghi.**

On *Sorghum*. Aiken, S. Car. (c140).

Uredo Quercus. *Brond.*

On *Quercus virens*. Darien (2502).

Uredo luminatum. *Schw.*

On *Rubus*. Darien, Georgia (2435).

Cystopus cubicus. *Str.*

On *Convolvulus*. Aiken, S. Car. (2636).

Cystopus Portulacæ. *D.C.*

On *Portulaca*. Aiken, S. Car. (2613).

Torula herbarum. *Link.*

On *Chenopodium*. Aiken, S. Car. (2590).

Sporidesmium atropurpureum. *B. & C.*

On logs of *Liquidambar*, &c. Florida (98, 137).

It is somewhat doubtful whether this is not an Alga.

Gymnosporium inquinans. *Berk.*

On *Arundinaria*. Aiken (2466, 2507).

Spores smaller than in *G. arundinis*.

Ceratium hydnoides. *A. & S.*

On *Myrica*. Darien, Georgia (2447).

Microcera coccophila. *Desm.*

On *Morus*. Darien, Georgia (2512).

Fusarium lateritium. *Nees.*

On *Robinia*. Aiken, S. Car. (2626).

Fusisporium Betæ. *Desm.*

On tubers. Aiken, S. Car. (2578).

Fusarium roseum. *Link.*

On *Ficus*. Aiken, S. Car.

Sporocybe Persicæ. *Fr.*

On *Persica*. Aiken, S. Car.

Sporocybe byssoides. *Fr.*

On *Vitis æstivalis*. Aiken, S. Car. (2605).

Stilbum glaucum. *Cke.*

Stipite cylindrico, griseo-albo; capitulo concolore, globoso; sporis subglobosis, hyalinis (0.04 mm.).

On *Myrica*. Darien, Georgia (2470).

Seated on an erumpent black stroma, perhaps an old *Diatrype*. It resembles *Stilbum vellereum*, B. & C., but is not tomentose.

Graphium explicatum. *B. & C.*

On herbaceous stems. Aiken, S. Car.

Cladosporium atriellum. *Cke.*

On flower stalk of *Yucca* (2563, 2566).

Cladosporium nodulosum. *Cke.*

On spinach. Darien, Georgia (2395).

Macrosporium abruptum. *Cke.*

On *Hibiscus esculentus*. Aiken (1988).

Macrosporium commune. *Rab.*

On *Cycas*. Darien, Georgia (2543).

Macrosporium Cheiranthi. *Fr.*

On *Ficus*. Aiken, S. Car. (2597).

Helminthosporium macrocarpum. *Grev. var. caudatum. B. & C.*

On oak. Darien, Georgia (2474).

Helicoma Curtisii. *B.*

On bark. Aiken, S. Car. (2341).

Helicoma Berkeleyi. *Curt.*

On logs. Darien, Georgia.

On oak. Darien, Georgia (2490).

On *Arundinaria*. Darien, Georgia (2508).

Peziza (Dasy) albocitrina. *Cke.*

Stipitata, villosa, alba. Cupulis turbinatis, demum expansis, ($\frac{3}{4}$ mm.), stipite brevi, disco citrino; ascis cylindraceis; sporidiis linearibus, rectis (.01 mm.); paraphysibus acuminatis.

On *Vaccinium* leaves. Darien, Georgia (2476).

Closely allied to *P. virginella*, C. & E.

Peziza (Belonidium) eustegiaeformis. *B. & C.*

On *Arundinaria*. Darien, Georgia (2462).

Peziza (Moll) vinosa. *P.*

On bark. Darien, Georgia (2517).

Peziza (Dasyscypha) alboviridis. *Cke.*

Sparsa, sessilis, villosa. Cupulis hemisphericis, aerugineo-villosis ($\frac{1}{2}$ - $\frac{3}{4}$ mm.); margine albedo, disco ochraceo, concavo; ascis cylindraceis; sporidiis linearibus, obtusis, rectis (.008-.01 mm.); paraphysibus filiformibus; pilis asperulis, septatis, virido-tinctis.

On decorticated *Myrica*, or in fissures of the bark. Aiken (2447).

Peziza (Mollisia) melichros. *Cke.*

Sparsa, sessilis. Cupulis minimis (vix $\frac{1}{2}$ mm) mellicoloribus, demum applanatis, extus saccharino-granulatis; margine leniter elevato; ascis cylindraceis; sporidiis subellipticis (.005 mm. long); paraphysibus filiformibus.

On bark. Alabama (Peters).

Pocillum Americanum. *Cke.*

Hypophyllum, sparsum. Cupulis cyathiformibus, infra in stipitem brevem attenuatis, fuliginis; margine pallidiore; ascis clavatis; sporidiis cylindrico-clavatis, triseptatis, leniter curvulis (.038-.045 \times .004 mm.); paraphysibus filiformibus.

On *Quercus virens* leaves. Darien, Georgia (2502).

Asci and sporidia quite distinct from those of the European species, which it much resembles.

Ascobolus furfuraceus. *Pers.*

On cow dung. Darien, Georgia (2524).

Ascobolus (Ascophanus) papillatus. *Pers.*

On cow dung. Darien, Georgia.

Stictis versicolor. *Fr.*

On branches. Darien, Georgia (2441).

PHILLIPSIELLA. *Gen. nov.*

Primo globosa, pertusa, demum applauata, velo membranaceo tecta, excipulo membranaceo; ascis saccatis; sporidiis hyalinis, absque paraphysibus.

Phillipsiella atra. *Cke.*

Epiphylla, punctiformis, atra; disco fuligineo; sporidiis ellipticis, biseriatis, hyalinis ($.013 \times .004$ mm.).

On leaves of *Quercus virens*. Darien, Georgia (2501).

This genus is dedicated to W. Phillips, of Shrewsbury, an earnest worker at the Discomycetes. This is a low form of Discomycetes, removed from Ascomyces by the presence of a membranaceous excipulum, on which the asci are seated, without any intermediate cellular stratum. At first it resembles a small *Sphaeria* pierced at the apex, but is afterwards expanded.

Dermatea Magnoliæ. *B. & C.*

On *Magnolia*. Darien, Georgia (2510).

Agyrium rufum. *Pers.*

On *Juniperus*. Darien (2533).

Phacidium dentatum. *Fr.*

(Stylospores.)

On oak leaves. Aiken, S. Car. (2575).

Dichæna faginea. *Fr.*

On *Fagus*. N. Hampshire.

Eustegia Magnoliæ. *Rav.*

On leaves of *M. glauca* (2542).

Rhytisma Austini. *Cke.*

Tenne, convexum, atrum, nitidum, rugulosum, hinc illic fertile; ascis clavatis; sporidiis ellipticis, hyalinis ($.02 \times .01$ mm.).

On leaves. Cotoosa, Fla. (Anstin), 2559.

Resembling *R. tostum*, but smaller.

Rhytisma tostum. *B. & C.*

On oak leaf. Darien (2468).

Rhytisma Curtisii. *B.*

On leaves of *Ilex*. Darien, Georgia (2487).

Triblidium rufulum. *Spr.*

On *Rhus*. Darien (2458).

On *Morus*. Darien.

Hysterium putaminum. *Cke.*

Gregarium, vel sparsum, atrum. Peritheciis ellipticis, obtusis, labiis rigescentibus; ascis clavatis; sporidiis biseriatis, ellipticis, triseptatis, hinc illic divis, fuscis ($.025 \times .012$ mm.).

On peach stones. Aiken, S. Car. (2603).

A very curious and interesting little species, not larger than a denudate *Sphaeria*.

Hysterium Cyrillæ. *B. & C.*

On twigs. Darien (171c).

Hysterium (Lophodermium) maculare. *Fr.*

On *Liriodendron* leaves. Stylospores. Aiken, S. Car. (2600).

On *Persca Carolinensis*. Darien, Georgia (2545).

Hysterium (Hypoderma) virgultorum. *D.C.* var. **petiolare.**
On petioles of *Liriodendron*. Aiken, S. Car. (2599).

Actidium ? diatrypoides (*pro. tem.*)
On *Carpinus*. Darien, Georgia (2425).
On *Ostrya* (2331).

Asterina cuticulosa. *Cke.*
Sparsa, orbicularis, atro-brunneis. Peritheciis pelliculosis, applanatis; mycelio obsoleto; ascis globosis ($\cdot 025$ mm.); sporidiis ellipticis, uniseptatis, utrinque rotundatis, subconstrictis, hyalinis ($\cdot 01 \times \cdot 005$).

On leaves of *Ilex opaca*. Darien (2486).

The globose asci are scattered at regular intervals beneath the thin cuticle, which is slightly elevated in those places. A somewhat abnormal species.

Capnodium citri. *B. & M.*
On *Citrus*. Darien, Georgia (2415).

Myriangium Curtisii. *B. & Desm.*
On hickory. Darien.

Meliola amphitricha. *Fr.*
On *Persea* (2499).

Meliola tenuis. *B. & C.*
On *Arundinaria* (2482).
Scarcely different from *M. amphitricha*.

Sphærotheca pannosa. *Ler.*
On *Rosa*. Aiken, S. Car. (2568).

SACCARDIA. *Gen. nov.*
Mycelium arachnoideum, plerumque evanidum; conceptacula globosa; sporangiis globoso-ovatis, 8 sporis repleta; sporis ellipticis, polyblastis; appendiculæ nullæ, aut cum mycelio intertextæ.

Saccardia quercina. *Cke.*
Hypophylla. Mycelio evanido; conceptaculis gregariis vel sparsis; sporangiis globosis, octosporis; sporis ellipticis, hyalinis, merenchymatis $\cdot 02 \times \cdot 01$ mm.

On leaves of *Quercus virens*. Darien, Georgia (2504).

Allied to *Erysiphe*. Dedicated to Professor Saccardo, of Padua, whose valuable contributions to Mycology merit distinct recognition.

Sphærostilbe gracilipes. *Tul.*
On *Platanus* (conidia). Aiken (1820).

Hypocrea chlorina. *Cke.*
Applanata, discoidea, elliptica, vel elongata, argillacea, intus citrina. Peritheciis immersis, brunneis; ostioli punctiformibus; ascis clavatis; sporidiis biseriatis, elongato-ellipticis, 4 nucleatis, demum triseptatis ($\cdot 025 \times \cdot 009$ mm.).

On hickory. Darien (2411).

A very curious species, but slightly elevated above the bark, and of the same colour; stroma bright sulphur coloured, in which the brown membranaceous perithecia are immersed.

Nectria episphæria. *Tode.*

On old *Diatrype*. Darien (2423, 2530, 2422, 2473).

Nectria rubicarpa. *Cke.*

Cæspitosa, rubra. Peritheciis globosis, vix papillatis, obtuse verrucoso-rugosis; ascis cylindræis; sporidiis uniseriatis, ellipticis, uniseptatis, constrictis ($\cdot 012 \times \cdot 007$ mm.), cellulis sub-globosis.

On *Gelsemium*. Aiken, S. Car. (2593).

Like a miniature red raspberry, both in the clusters and individual perithecia, the latter becoming eventually nearly even.

Nectria nigrescens. *Cke.*

Cæspitosa, rubra, demum nigrescens, glabra; ostiolo papillæformi; ascis cylindræis; sporidiis elongato-ellipticis, uniseptatis ($\cdot 018 \times \cdot 006$ mm.); stylosporibus in stromate gerentibus, aliis ovatis brunneis ($\cdot 005 \times \cdot 003$ mm.), aliis linearibus ($\cdot 006 \times \cdot 002$ mm.), hyalinis.

On *Gleditschia*. Aiken, S. Car. (2380a).

Nectria depauperata. *Cke.*

Peritheciis globosis, coccineis, vix papillatis, 1-3 in stromā (*Fusarium yuccæ*) nidulantibus; ascis clavatis; sporidiis ellipticis, uniseptatis ($\cdot 01 \times \cdot 0035$ mm.); stylosporibus fusiformibus, curvulis, utrinque acutis ($\cdot 025 \times \cdot 003$ mm.).

On *Yucca aloifolia*. Aiken, S. Car. (2564).

Nectria coccinea. *Fr.*

On hickory. Darien, Georgia (2411a).

Dothidea scutula. *B. & C.*

On leaves of *Persea*. Darien, Georgia (2450).

Dothidea Magnoliæ. *Cke.*

Epiphylla, sparsa, atra, elliptica, vel angulata, applanato-convexa, rugosa; ascis clavato cylindræis; sporidiis cylindricis, obtusis, leniter curvulis, triseptatis, hyalinis ($\cdot 02 + \cdot 005$ mm.).

On leaves of *Magnolia*. Darien (2485).

Dothidea sphæroidea. *Cke.*

Superficialis, subglobosa, atra, sparsa, minute rugosa; ascis saccato-clavatis; sporidiis inæqualiter uniseptatis, brunneis ($\cdot 032 \times \cdot 02$ mm.).

On living *Juniperus* foliage. Darien, Georgia (2429).

Upper cell of the sporidia globose, $\cdot 02$ mm. diam.; lower cell nearly globose, $\cdot 01$ - $\cdot 012$ mm. diam.

Dothidea graminis. *P.*

On *Erianthus*. Aiken (1804).

On *Arundinaria*. Darien (2461, 2620).

Dothidea artemisiæ. *Schw.*

On herbs. Aiken (2607).

Stigmatæa arundinariæ. *Cke.*

Epiphylla, gregaria. Peritheciis subglobosis vel depressis, opacis, atris, astomis, superficialibus; ascis clavatis; sporidiis fusoides, 4 nucleatis, demum triseptatis, hyalinis ($\cdot 026$ - $\cdot 03 \times \cdot 008$ - $\cdot 01$ mm.).

On *Arundinaria*. Darien, Georgia (2483).

Gibbera pulicaris. Fr.

On *Opuntia*. Florida (2555).

Gibbera moricarpa. Cke.

Pustulis erumpentibus. Peritheciis convexo-applanatis, atris, opacis, minute velutinis, demum subglabris; ascis late clavatis; sporidiis numerosis, linearibus, curvulis, obtusis (·008-·01 mm. long).

On *Myrica*. Darien, Georgia (2471, 2540).

A very curious species. It is *Fracchiæa heterogenea*, Sacc., according to Prof. Saccardo.

Cucurbitaria radicalis. Cke.

Pustulis variis, erumpentibus, valsoideis, prominulis; peritheciis atris, ovatis, papillatis, opacis; ascis clavatis; sporidiis linearibus, leniter curvulis, obtusis (·008 mm.).

On roots of oak. Aiken, S. Car. (1680).

Hypoxyylon malleolus. B. & Rav.

Issued in Ravenel's *Fungi Americani*, No. 181, by error, under the name of *Hypoxyylon concentricum*, Fr.

Hypoxyylon annulatum. Mont.

On oak. Darien, (2488, 2492, 50).

This species and the following, if carefully studied, will be found to be quite distinct.

Hypoxyylon marginatum. Schwz.

On *Myrica* (2460).

On oak (2532, 2413).

Hypoxyylon confluens. Fr.

On oak. Darien, Georgia (2419).

Hypoxyylon sassafras. Schw.

On *Persea*. Darien (2463).

Hypoxyylon perforatum. Schw.

On *Arundinaria*. Darien (2506).

On oak. Darien (2404).

Hypoxyylon culmorum. Cke.

Parvum, convexum, ellipsoideum, atrum, nitidum. Ostiolo papillæformi. Ascis cylindræis. Sporidiis naviculoideis, curvulis, nucleatis, brunneis (·015-·018 × ·006 mm.).

On *Arundinaria*. Darien, Georgia (2505).

Nummularia discreta. S.

On branches. Cotoosa. Fl. (2558).

Diatrype stigma. Fr.

On oak. Darien, Georgia (2412).

Diatrype hypophlæa. B. & Rav.

On *Persea*. Darien (2539).

Diatrype microplaca. B. & C.

On *Persea*. Darien (2465).

Diatrype rumpens. Cke.

On *Fraxinus*. Aiken (1555).

Melogramma Wisteriæ. Cke.

= *Thumonia Wisteriæ*. Rehm.

On branches of *Wisteria*. Aiken (2615).

Melogramma ambiguum. *S.*

On *Rhus*. Darien (2489, 2518).

Melogramma liriodendri. *Cke.*

On *Liriodendron*. Aiken, S. Car. (1565).

Melogramma gyrosum. *Schw.*

On oak. Darien (2538)

Valsa stellulata. *Fr.*

On *Fraxinus*. Darien (2467, 2430).

On *Morus*. Darien (2477, 2472).

On *Liquidambar*. Aiken.

On *Xanthoxylum*. Darien (2442).

Valsa leucostoma. *Fr.*

On *Cerasus*. Aiken (2606, 2574).

On peach. Aiken (2576).

Valsa aculeans. *Schw.*

On *Rhus*. Darien (2520).

Valsa vitis. *S.*

On *Vitis*. Darien (2446).

Valsa glandulosa. *Cke.*

Pustulis epidermide tectis, ostiolis convergentibus, erumpentibus, nigris, nec stellatis. Ascis clavatis (.03 × .01 mm.) Sporidiis minimis, spermatoides (.005 mm. long)

On *Ailanthus*. Aiken (2385).

Valsa sabalina. *Cke.*

Tecta, prominula. Pustulis in maculis elongatis nigricantibus insidentibus; ostiolis convergentibus, emergentibus. Ascis clavatis. Sporidiis linearibus, obtusis, curvulis (.008-.009 mm. long).

On *Sabal*. Darien (2437).

Sphæria (Byss) aquila. *Fr.*

On oak. Darien (2409).

On *Gelsemium* (conidia) (2594, 2604).

Sphæria pezizula. *B. & Rar.*

On oak. Darien (2459, 2495).

Sphæria (Byss) parvicapsa. *Cke.*

Peritheciis minimis, in byssum floccosam, atro-brunneam insidentibus. Ascis clavato-cylindricis. Sporidiis ellipticis, triseptatis, brunneis (.012-.014 × .006 mm.).

On logs. Aiken (2341a).

Sphæria (Villosæ) decastyla. *Cke.*

Peritheciis sparsis, globosis, minimis, villosis. Ascis cylindrico-clavatis. Sporidiis fusiformibus, nucleatis, demum 5 septatis, hyalinis (.03 × .005 mm.).

On oak. Darien (2420).

Hairs about .09 mm. long.

Sphæria (Pertusæ) putaminum. *Schw.*

On peach stones. Aiken (2602).

Sphæria (Villosæ) scopula. *C. & Pk.*

On wood. Aiken, S. Car. (2443).

Sphæria (Immersa) inusta. *Cke.*

Sparsa, immersa, nigrofacta; ostiolo albido. Ascis cylindraceis. Sporidiis uniseriatis, ellipticis, triseptatis, brunneis ($\cdot 015\text{--}\cdot 018 \times \cdot 008$ mm.).

On *Juniperus*. Darien (2413).

Sphæria pustulata. *Sacc.?*

On *Cerasus*. Aiken (2572).

Sphæria (Diaporthæ) Baccharidis. *Cke.*

Sparsa, punctiformis, cuticula tecta, ostioliis brevibus, erumpentibus. Ascis clavatis. Sporidiis fusiformibus, quadrinucleatis ($\cdot 018\text{--}\cdot 02 \times \cdot 003$ mm.).

On *Baccharis*. Darien (2424).

Sphæria palmetta. *Cke.*

Tecta, subprominula; ostioliis erumpentibus. Ascis cylindraceis vel clavatis. Sporidiis lanceolatis, obtusis, 4 nucleatis, demum 3 septatis, leniter constrictis, hyalinis ($\cdot 03 \times \cdot 007$ mm.).

On *Sabal*. Darien (2436).

Sphæria Sabalensis. *Cke.*

Tecta, numerosa. Peritheciis punctiformibus, atro-brunneis. Ascis clavatis. Sporidiis biseriatis, arcte fusiformibus, utrinque filiformi-attenuatis, hyalinis, rectis vel curvulis-nucleatis, dein 1-3 septatis ($\cdot 05 \times \cdot 005$ mm.).

On *Sabal*. Darien (2455).

Sphæria (Caulicolæ) anthelmintica. *Cke.*

Sparsa, tecta, parce elevata; ostioliis punctiformibus, epidermide pertusis. Ascis cylindraceis. Sporidiis fusiformibus, tri-septatis, fusceolis, leniter constrictis ($\cdot 03 \times \cdot 007$ mm.).

On *Chenopodium anthelminticum*. Aiken, S. Car. (2590).

Sphæria andromedæ. *S.*

On leaves of *Andromeda*. Darien (2475).

Sphærella Ravenelii. *Cke.*

Hypophylla, tota pagina occupans. Peritheciis minimis, vix conspicuis, brunneis. Ascis clavatis. Sporidiis ellipticis, uniseptatis, superne leniter incrassatis ($\cdot 008 \times \cdot 004$ mm.).

On oak leaves. Aiken (2596).

Sphærella Pittospori. *Cke.*

Gregaria. Peritheciis atris, semi-immersis, in maculis angulatis, veni-limitatis, congestis. Ascis clavato-cylindricis. Sporidiis ellipticis, uniseptatis, utrinque rotundatis, leniter constrictis ($\cdot 01 \times \cdot 004$ mm.).

On leaves of *Pittosporum*. Aiken (2589).

Sphærella Catesbeyi. *C.*

Hypophylla, immersa. Peritheciis sparsis, sæpe 2-4 congestis, cuticula tectis, demum fissuratis. Ascis clavatis. Sporidiis lanceolatis, uniseptatis ($\cdot 02\text{--}\cdot 022 \times \cdot 004$ mm.).

On leaves of *Quercus Catesbeyi*. Darien (2046).

Sphærella Wisteriæ. *Cke.*

Punctiforma, sparsa. Peritheciis semi-immersis, atris, minimis. Ascis clavatis. Sporidiis ellipticis, uniseptatis ($\cdot 008 \times \cdot 003$ mm.).

On leaves of *Wisteria sinensis*. Aiken (2551).

Sphærella glaucescens. *Cke.*

Hypophylla. Peritheciis semi-immersis, in maculis orbicularibus, minimis congestis. Ascis clavatis ($\cdot 03 \times \cdot 01$ mm.) Sporidiis ellipticis ($\cdot 006 \times \cdot 003$).

On leaves of *Acer rubrum*. Aiken (2601).

Sphærella Bumeliæ. *Cke.*

Epiphylla. Peritheciis atris, semi-immersis, in maculis sub-orbicularibus, nigrofactis congestis. Ascis clavato-cylindræis. Sporidiis ellipticis, uniseptatis ($\cdot 012 \times \cdot 004$ mm.).

On leaves of *Bumelia*. Darien (2434).

Sphærella cerasina. *Cke.*

Hypophylla. Peritheciis atris, semi-immersis, in maculis sub-orbicularibus congestis. Ascis cylindræis. Sporidiis arcte ellipticis, uniseptatis ($\cdot 01 \times \cdot 0025$ mm.).

On leaves of *Cerasus lauro-cerasus* (2573).

Sphærella vaccinii. *Cke. Hdbk.*

On leaves of *V. arboreum*. Aiken (2591).

Gnomonia petiolorum. *S.*

On petioles of *Liquidambar*. Darien (2496).

The following numbers were sterile, and hence indeterminable :—
Phoma, 2481 ; Vermicularia, 2484 ; Rhinotrichum, 2547 ; Cenangium, 1833 ; Actidium, 2425, 2331 ; Nectria, 2478 ; Dothidea, 2554 ; Sphærella on Platanus, 1838, on oak 1922, and on pear leaves.

NEW DIATOMS.

By Prof. H. L. SMITH, LL.D.

The following new Diatoms are described by Professor H. L. Smith in the first number of the "American Quarterly Microscopical Journal."

Homæocladia capitata. *H. L. S.*

Frond membranaceous, umbellately branched ; branches elongated, and with corymbose capitate apex. Frustules linear, valves lanceolate, with acute and very slightly constricted apices ; frustules densely packed, but not in series, or fascicles ; marginal punctæ faint, 35 in $\cdot 001$. Length of frustule, $\cdot 0008$ in. ; breadth, $\cdot 0002$ in. Frond, 1.5" to 2".

Black Rock, California.

Meridion intermedium. *H. L. S.*

Frustules sessile, cuneate, margins nearly smooth, valves with very faint perversus costæ in f. v., which are scarcely discernible in s. v., cuneate, rounded at the larger extremity. Length $\cdot 00166$ to $\cdot 003$.

Knoxville, Tenn.

Navicula Kutzingiana. *H. L. S.*

Frustules linear, valves scarcely inflated, with rounded ends, and three or four conspicuous striæ radiating from the central nodule, and which are prominent also, along with the central nodule, in f. v. Frustules in f. v. quadrangular, frequently adhering and forming a short filament (*Diademes*), and with two distinct intra-marginal (bead-like) vittæ at either end. Length $\cdot 0006$ to $\cdot 00085$, breadth f. v. $\cdot 00035$, s. v. $\cdot 00021$. Striæ about 50 in $\cdot 001$.

Avranches, Normandy, France (de Brebisson).

Navicula parvula. *H. L. S.*

Frustules small, valves lanceolate, with acute apices. Striæ divergent, and readily seen. Frustules linear in f. v. with rounded ends. Length $\cdot 0005$; breadth $\cdot 00015$. Striæ 42 in $\cdot 001$.

Villerville, France (de Brebisson).

Nitzschia Kittoni. *H. L. S.*

Frustules linear, valves lanceolate, with sharp and slightly constricted apices, marginal punctæ very distinct, 16 in $\cdot 001$ and quite prominent in f. v. Striæ faint. Length $\cdot 0007$ to $\cdot 001$; breadth, $\cdot 0002$.

River Catuche, Caracas, Venezuela (F. Kitton).

Raphoneis australis. *H. L. S.*

Frustules somewhat variable in size, valves cuneate, rounded at the larger end, and coarsely moniliform striate, striæ interrupted by a smooth blank space, frustules slightly cuneate in f. v. Length $\cdot 0005$ to $\cdot 00086$; breadth, $\cdot 00022$ to $\cdot 0004$. Striæ about 30 in $\cdot 001$.

Royal Sound, Kerguelen's Land (Dr. J. H. Kidder).

Rhizosolenia Eriensis. *H. L. S.*

Frustules of medium size, compressed, and somewhat flattened; six to twelve times as long as broad; annuli on the dry frustules conspicuous, alternate, and with a zig-zag median connection, valves finely striate, bristles nearly or quite as long as the frustules, and with the calyptra excentric, lying nearly in a line with one margin of the frustule when the flat side is in view. Length of frustules $\cdot 003$ to $\cdot 006$.

Buffalo, N.Y.; Lake Erie; Cleveland, Ohio; Lake Michigan.

Cestodiscus Baileyi. *H. L. S.*

Disc circular, diam. $\cdot 0025$ to $\cdot 0028$, inflated, and with distinct radiating granules, and showing more or less the characteristic subulate blank spaces of *Actinocyclus*; without umbilicus; processes intra-marginal, small, and numerous; the punctæ near the margin of the valve are in parallel rows, 27 in $\cdot 001$. Secondary plate or septum, with a large central opening, fringed with somewhat irregular rays, which do not reach the margin.

Lower Lake Klamath, Oregon (Lt. Williamson).

Amphora mucronata. *H. L. S.*

Frustules in f. v. broadly oval, dorsum with distant longitudinal lines, ventral surface with indistinct longitudinal lines, or furrows, central nodule elongated and pointed (mucronate), end touching

the margin of the connecting zone, which is of variable breadth, nodules at the end quite small. Median line strongly and sharply inflected and minutely punctate along its whole length, an irregular row of minute lines or elongated dots on the valve within the margin. In s. v. dorsum very convex; ventral margin straight, or nearly so, with slight constriction at the ends; central nodule indistinctly shown (out of focus). Striæ excessively minute. Length .0026; breadth .0012 to .002.

Atlantic marshes, N.J. (Dr. Lewis).

Actinocyclus Niagaraë. H. L. S.

Disc large, diam. .0038, valves very much inflated, and densely packed with minute radiating punctæ, which are scattered loosely and irregularly at the centre, and sometimes radiate from two central blank spaces. In the living form the connecting membrane is broad, and the highly inflated valves cause it to lie obliquely. There is a characteristic circlet of minute spines within the margin of the valves, and the subulate blank spaces, so characteristic of *A. Ralfsii*, are more or less apparent.

Lake Erie (H. C. Gaylord).

The above species are illustrated on one plate, in the Journal from which the above descriptions are derived.

CLAVIS HYMENOMYCETUM.

For obvious reasons we shall content ourselves with an announcement of the appearance of this work under the title of "Clavis Synoptica Hymenomycetum Europæorum," the joint authors being the editor of this Journal, and Dr. Quelet. It is clearly, neatly, and compactly printed in a pocket volume for field work. Interleaved copies for notes are being prepared at a slight additional cost.

The arrangement to a great extent follows that of Fries' last work, including all the European species since described, with short characters of each species, just sufficient for the field, in Latin, so as to be available for all European countries. A distinctive mark indicates the British species. Wherever a species has been accurately figured, reference to that figure is given. Some few new species are published for the first time, chiefly from the Vosges.

It was considered advisable not to initiate any considerable departures from the "Monographia" of Fries, since no explanation or reasons could be given within the scope of the work. Nevertheless, in the judgment of the authors, some of the species recorded in that work have been considered as entitled to rank only as varieties; and, in other instances, species placed by error in wrong genera, or subgenera, are transferred to the company of their nearest allies. The work may be obtained in the chief capitals of Europe, or direct from the publishers.

REHM'S ASCOMYCETEN.

The publication of another fasciculus of this collection was announced in our last number. We have since had occasion to examine some of the specimens, on which a few observations are necessary.

No. 451. *Plicaria tracheia*, Rehm, is identical with *Boudiera alveolata*, C. & Phil., and is intermediate between *Ascobolus* and *Ombrophila*; in some respects allied also to *Sphaerosoma*.

No. 454. This is certainly not the typical form of *Peziza hirta*, but intermediate between *P. hirta* and *P. scutellata*.

No. 456. *Humaria umbrata*, is a large pallid form, but the fructification is the same as in the type.

No. 457. Dr. Rehm is certainly wrong in his assumption that *Peziza fuscescens*, P., and *Peziza fuscidula*, C. & E., are the same species. This will be manifest when we publish figures of both in an early part of "Mycographia."

Meliola quinqueseptata, Rehm, No. 492, is stated to be the same as *Meliola quinquespora*, Thum. There seems to be a curious fatality about this species; fortunately the specimens can be consulted in both instances. The description by Thuemen, which is quite different from his specimens, would be a novelty in *Meliola*. It says that the asci are ellipsoid, $.035-.038 \times .01-.012$ mm., containing 5 ovate sporidia, which are simple, hyaline, $.01 \times .005$ mm. The specimens clearly show that he has mistaken the sporidia for asci, and the five cells for five sporidia—a most extraordinary error, but nevertheless true, for he calls the asci brown and the sporidia hyaline. We have examined the specimens; the sporidia are precisely as in *Meliola amphitricha*, brown, with four septa, and consequently five cells, the dimensions of the mature sporidia are rather more than those given above. There are two of these sporidia in each ascus, but when fully mature the asci are dissolved. Dr. Rehm, evidently finding the name an error, changes it to *M. quinqueseptata*, which is again erroneous, for neither in his specimens nor in those issued by Thuemen are the sporidia more than four septate, either name conveys a wrong impression. It is curious that neither Thuemen nor Rehm has indicated the main point of distinction, in fact the *only* difference between this species and *M. amphitricha*, with which evidently neither of them are much acquainted, or they would have recognized the distinction at once. In passing, it may be stated that *Helminthosporium orbiculare*, Thum., according to specimens received from him, is *Meliola amphitricha*, Fr., and that *Meliola Mac-Oweniana*, Thum., is most decidedly not a *Meliola* at all, but a very good species of *Asterina*, and will therefore stand as *Asterina Mac-Oweniana*, and *Meliola Psilostomæ*, Thum., No. 775, is also an *Asterina*, although the specimens are scarcely mature. On the other hand, *Meliola microtheca*, Thum., No. 851, cannot be distinguished from *M. amphitricha*,

of which four forms are published in "Ravenel's American Fungi." In the description of *Meliola microtheca*, the very same kind of error is repeated as to sporidia as in *M. quinquiespora*. We would strongly recommend Baron Thuemen to examine his specimens again, and obtain a clearer idea of the genus by comparing them with *M. amphitricha*, and M. Bornet's monograph; for he will gain himself no credit by descriptions such as these; assuming, of course, that he distributes the specimens he describes, since our judgment is based upon his own specimens.

Pertinent to this subject, it may be mentioned that *Meliola abjecta*, Schroter, in Rabenhorst's "Fungi Europæi," No. 2424, is certainly not a *Meliola*, although it is probably an *Asterina*. The characters of the genus *Meliola* are given in the "Annales des Sci. Nat.," 3rd ser., Vol. xvi., p. 267. Specimens of *Meliola* are published in Ravenel's "North American Fungi," Nos. 81 to 84, 88, and others. *Asterina veronicæ* (Lib.), "Grevillea," v., p. 122, is the same as *Meliola abjecta*, Schroter, and *Dimenosporium abjectum*, Fekl.

CORTINARIUS.

The following additional plates have been prepared for publication in successive numbers of this journal. They are chiefly from drawings by Dr. L. Quelet, except where otherwise stated:—

- Plate 110, fig.* 1. *Cort. caninus*, Fr.
 2. *Cort. myrtillinus*, Fr.
 3. *Cort. miltinus*, Fr.
 4. *Cort. cinnabarinus*, Fr. In this figure the colour is too dark and brown for the typical form, which Dr. Quelet states should be a beautiful orange-vermilion.
 5. *Cort. sanguineus*, Fr.
- Plate 111, fig.* 1. *Cort. sanguineus*, Fr.
 2. *Cort. cinnamomeus*, var. *semisanguineus*, Fr.
 3. *Cort. croceo-conus*, Fr. (*cinnamomeus*, Fr., var.)
 4. *Cort. orellanus*, Fr.
 5. *Cort. cotoneus*, Fr.
 6. *Cort. raphanoides*, Fr.
 7. *Cort. bivelus*, Fr. Pileus too dark. It should be of a flesh-coloured ochre.
 8. *Cort. urbicus*, Fr.
- Plate 112, fig.* 1. *Cort. plumiger*, Fr.
 2. *Cort. scutulatus*, Fr.
 3. *Cort. evernius*, Fr. (*scutulatus*, Fr., var.)
 4. *Cort. limonius*, Fr.
 5. *Cort. acutus*, Fr.

Plate 113, fig. 1. *Cort. hinnuleus*, *Fr.*

2. *Cort. brunneus*, *Fr.*

3. *Cort. flexipes*, *Fr.*

4. *Cort. rigidus*, *Fr.*

5. *Cort. paleaceus*, *Fr.*

6. *Cort. subferrugineus*, *Fr.*

7. *Cort. ianthipes*, *Fr.*

Plate 114, fig. 1. *Cort. isabellinus*, *Fr.*

2. *Cort. germanus*, *Fr.*

3. *Cort. decipiens*, *Fr.*

4. *Cort. paleaceus*, *Fr.*

5. *Cort. fasciatus*, *Fr.*

6. *Cort. milvinus*, *Fr.*

Plate 115, fig. 1. *Cort. duracinus*, *Fr.*

2. *Cort. erythrinus*, *Fr.*, stipite purpurino, apice violaceo.

3. *Cort. castaneus*, *Bull.*, from drawing by Dr. Bull, "stipite purpureo-violaceo."

4. *Cort. sanguineus*, *Fr.* Ditto.

Plate 116, fig. 1. *Cort. latus*, *Fr.*

2. *Cort. fulvescens*, *Fr.*

3. *Cort. traganus*, *Fr.*

Plate 117, fig. 1. *Cort. pholideus*, *A. & S.*, from drawing by W. Phillips.

2. *Cort. torvus*, *Fr.*, drawing by Dr. Bull, referred by Quelet to *Cortinarius brunneus*.

The references to the majority of these figures are already given in the "Clavis."

BOTANICAL LOCALITY RECORD CLUB.

It is desired to enlist the co-operation of Botanists in general, and more especially of Bryologists, in a scheme set on foot by the Botanical Locality Record Club for investigating the geographical distribution of Mosses in the British Isles.

The Botanical Locality Record Club was founded in 1873, for the purpose of working out the distribution of British Plants; records, accompanied by specimens as vouchers, being sent in by the members and embodied by the Recorder in an Annual Report on the plan of "Topographical Botany." The Club, which commenced with 54 members, now contains nearly 100, including some of our most eminent botanists. A large amount of work has been done by the Club during the five years that it has been in existence, the floras of several counties, previously almost unexplored, have been worked out, and a very large number of additions have been made to the flora of many others. Up to the present time the Reports have dealt only with the flowering plants

and vascular acrogens. In 1875, however, a suggestion was made that the Club should include in its field the other orders of Cryptogamia, and it is considered desirable that, if possible, this should be carried into effect. It is proposed to start with the Mosses, for which order Mr. C. P. Hobkirk, F.L.S., and Mr H. Boswell, have consented to act as Recorders. A list of the Mosses hitherto recorded in Great Britain, entitled "The London Catalogue of British Mosses," has been drawn up by Messrs H. Boswell and C. P. Hobkirk, as an aid to collectors, and to secure uniformity of nomenclature. A number of specimens have already been sent in by several members. At present, however, the funds in hand are not sufficient to allow of the publication of a Report on Mosses without seriously curtailing the Report on the Flowering Plants, which it is not considered desirable to do, especially seeing that bryologists constitute but a comparatively small proportion of the members of the Club. If more botanists interested in Mosses (say 30) could be induced to join the Club, the additional subscriptions (5s. each per annum), would suffice for the publication of a Report on Mosses.

The geographical distribution of the Cryptogamia is a field hitherto very little worked, yet full of promise. The Cryptogams are far less liable than the flowering plants to be introduced or exterminated by the direct agency of man, and though the lower Algæ and Fungi may depend for their occurrence rather upon the presence of their appropriate matrix or medium than upon geographical situation, there can be no doubt that the distribution of the perennial Mosses, Hepaticæ and Lichens, is largely governed by conditions of altitude, climate, rainfall, and geologic configuration; and the study of these conditions can hardly fail to yield valuable results. No one has hitherto attempted to work out the geographical distribution of the Mosses of Great Britain as Mr. Watson, in his "Topographical Botany," has that of the Phanogams, or as the Rev. W. A. Leighton, in his "Lichen Flora of Great Britain," has that of the Lichens.

Botanists wishing to join the Club are requested to send their names either to Dr. H. F. Parsons, Goole; or Mr. C. P. Hobkirk, Huddersfield.

The "London Catalogue of British Mosses" may be had of Mr. T. B. Blow, Welwyn. Price 4d.

F. ARNOLD LEES, Market Rasen,
Recorder for Flowering Plants.
CHAS. P. HOBKIRK, Huddersfield.
H. BOSWELL, Oxford.
H. FRANKLIN PARSONS, M.D., Goole.

SOME HIMALAYAN FUNGI.

By M. C. COOKE.

The following were communicated from the N.W. Himalayas, by J. Sykes Gamble, Esq. :—

***Æcidium Solani.* Mont.**

On leaves of *Solanum*. Sutlej Valley.

Probably the same as Montagne's species from Chili.

***Puccinia solani.* Cke.**

Caulicola. Soris atris, minimis, linearibus, subtus tomento insidentibus; pseudosporis ellipticis, leniter constrictis, fuscis ($0.035-0.04 \times 0.018-0.02$ mm.), pedicellis gracilis, elongatis, hyalinis.

On stems of *Solanum*, associated with *Æcidium Solani*. Sutlej Valley, India.

***Colæosporium pingue.* Lev.**

On leaves of *Astilbe*. Simla, 8,000 feet.

***Æcidium urceolatum.* Cke.**

Epiphyllum vel caulicolum, deformans. Peridiis congestis, cylindrico-urceolatis, sub-sulphureis. Sporibus aurantiacis, ovatis $0.25 \times 0.3 \times 0.02$ mm.

On *Thalictrum*, which is very much distorted. Kanawar, India, 8,000 feet.

This appears to be certainly distinct from *Æ. Thalictri*. Grev., the spores of which are 0.22×0.15 mm. The peculiar sulphur color of the peridia, independent of the color imparted by the spores, urceolate form, greater length, all indicate important differences, to say nothing of the twisting and distorting of the swollen peduncles and stems, which are not observed in *Æ. Thalictri*.

***Lecythea epitea.* Lev.**

On leaves of *Salix daphnoides*. Simla, 6,500 feet.

***Æcidium violæ.* Schum.**

On leaves of *Viola*. Simla, 6,500 feet.

***Lecythea ruborum.* Lev.**

On leaves of *Rubus flavus*. Sutlej Valley, 3,000 feet.

***Uredo Hypericorum.* D.C.**

On leaves of *Hypericum*. Simla, 6,500 feet. Spores immature.

WOOLHOPE ANNUAL FORAY.

The annual Foray of the Woolhope Club took place this year, as usual, at Hereford, throughout the week, from Oct. 1st to the 4th, and was well attended by mycologists from all parts of England. A general account of the proceedings having been published elsewhere, it is only necessary here to enumerate some of the principal species collected, and exhibited at the show.

Amongst Agarics were the following : *Ag. (Amanita) strobiliformis. Fr.*; *strangulatus. Fr.*; *Ag. (Lepiota) metulæsporus. B.*; *Ag. (Tricholoma) equestris. Fr.*; *sulfureus. Fr.*; *sejunctus. Sow.*; *resplendens. Fr.*; *acerbus. Bull.*; *rutilans. Schff.*; *columbetta. Fr.*; *saponaceus. Fr.*; *Ag. (Clitocybe) fragrans. Sow.*; *Ag. (Collybia) maculatus. A & S.*; *Ag. (Mycena) pelianthinus. Fr.*; *pterigenus. Fr.*; *Ag. (Omphalia) atropunctus. P.*; *fibula. Bull.*; *Ag. (Pleurotus) dryinus. P.*; *Ag. (Pluteus) umbrosus. P.*; *chrysophæus. Schff.*; *Ag. (Leptonia) euchrous. P.*; *Ag. (Claudopus) variabilis. P.*; *Ag. (Pholiota) caperatus. Fr.*; *radicosus. Bull.*; *heteroclitus. Fr.*; *unicolor. Fl. Dan.*; *Ag. (Inocybe) pyriodorus. Fr.*; *obscurus. P.*; *geophyllus. Sow.*; *Ag. (Nancoria) cucumis. P.*; *innocuus. Lasch.*; *Ag. (Crepidotus) mollis. Schff.*; *Ag. (Hypholoma) sublateralis. Schff.*; *velutinus. P.*; *Candolleanus. Fr.*; *Ag. (Psathyra) gossypinus. Bull.*; *Ag. (Psathyrella) disseminatus. P.*; *Coprinus comatus. Fr.*; *atramentarius. Fr.*; *Bolbitius titubans. Fr.*; *Cortinarius elatior. Fr.*; *collinitus. Fr.*; *arenatus. Fr.*; *cinnabarinus. Fr.*; *cinnamomeus. Fr.*; *armeniacus. Fr.*; *Paxillus pannoides. Fr.*; *Hygrophorus lacmus. Fr.*; *calyptræformis. B. & Br.*; *cossus. Fr.*; *metapodius. Fr.*; *Lactarius glyciosmus. Fr.*; *torminosus. Fr.*; *turpis. Fr.*; *volemum. Fr.*; *Russula lepida. Fr.*; *cyanoxantha. Fr.*; *foetens. Fr.*; *alutacea. Fr.*; *Cantharellus tubæformis. Fr.*; *Marasmius urens. Fr.*; *ramealis. Fr.*; *rotula. Fr.*; *Panus torulosus. Fr.*; *Boletus luteus. Fr.*; *scaber. Fr.*; *Strobilomyces strobilaceus. B.*; *Fistulina hepatica. Fr.*; *Polyporus squamosus. Fr.*; *intybaceus. Fr.*; *dryadeus. Fr.*; *chioneus. Fr.*; *conchatus. Fr.*; *ulmarius. Fr.*; *molluscus. Fr.*; *Trametes mollis. Somm.*; *Hydnum variæcolor. Fr.*; *Thelephora. Sowerbei. B.*; *anthocephala. Fr.*; *caryophyllea. P.*; *laciniata. P.*; *fastidiosa. Fr.*; *Cyphella galeata. Fr.*; *Clavaria amethystina. Bull.*; *cristata. P.*; *Kunzei. Fr.*; *aurea. Schff.*; *abietina. P.*; *fusiformis. Sow.*; *pistillaris. B.*; *Lycoperdon saccatum. Fr.*; *Helvella crispa. Fr.*; *lacunosa. Fr.*; *elastica. Bull.*; *ephippium. Fr.*; *Geoglossum viride. P.*; *Leotia lubrica. P.*; *Spathularia flavida. Fr.*; *Peziza succosa. B.*; *badia. P.*; *macropus. P.*; *firma. P.*; *aurantia. Fr.*; *cochleata. Fr.*; *onotica. P.*; *saniosa. P.*; *constellatio. B. & Br.*; *casia. P.*; *nivea. Fr.*; *cerina. P.*; *benesuada. Tul.*; *Dermatea dryina. Sp. nov.*; *Hypoecrea gelatinosa. Tode.*; *rufa. Fr.*; *Hypoxylon multifforme. Fr.*; *fuscum. Fr.*; *coccineum. Fr.*; *Eutypa spinosa. Tul.*; *Sphæria pulveracea. Ehr.*, and other species. *Sphærella peregrina. Sp. nov.*; *Balanina platyspora. B. & Br.*; *Tuber puberulum. B. & Br.*; *Pachyphæus melanoxanthus. Tul.*; *Phoma concentricum. Mont.*; *Torula hysterioides. Corda.*; *Mycogone cervina. Ditm.* In addition to which the Rev. M. J. Berkeley sent specimens of *Hygrophorus Wynnæ. B.*, a new species, found in North Wales. Altogether the meeting was equally successful with that of preceding years. The first week in October has been appointed for the meetings in 1879.

FUNGI NOVI, IN FENNIA DETECTI.

QVOS DESCRIPSIT P. A. KARSTEN.

1. *Mycena coprinoides*. n. sp.

Pileus membranaceus, obovoidens, obtusus, sulcatus, pilosellus, gilvo-pallidus. Stipes fistulosus, apice incrassatus, pilosus flocculosoque pruinellus, basi strigosus, hyalino albus. Lamellæ adnatæ, liberæ, subconfertæ, discretæ, albæ.

In rimis corticis *Salicis Capræ* in ditone Mustialensi, mensi inente Septembri, gregarie, crescens.

Mycena stylobates (Pers.), hinc proxime accedit. Pileus circiter 4 mm. altus, circiter 3 mm. latus. Stipes pilis erectis hirtellus, 1-2 cm. longus, circiter 1 mm. crassus. Sporæ minutissimæ.

2. *Galera viscidula*. n. sp.

Pileus campanulatus, striatus, viscidus, subochraceus, 6-8 mm. latus. Stipes æqualis, ferruginascens, sursum pallidior, deorsum obscurior, alboflocculosus, circiter 3 cm. altus, 1 mm. crassus. Lamellæ adnatæ, distantes, ex albido ferruginascentes. Sporæ sphaeroideo-ellipsoideæ, dilutissime flavescentes (sub lente), longit. 6-7 mm., crassit. 3-6 mm.

In culmis graminum emortuos prope Mustiala fine mensis Septembris, 1878, parcissime lecta.

3. *Collybia coracina*. Fr. var. *Cornui*.

Pileus submembranaceus, convexo-planus, disco depresso umbonato, striatus, glaber, hygrophanus. Stipes æqualis, e farcto subtiliter fistulosus, basi adscendens, subundulatus, apice subpruinellus, pallidus. Lamellæ adnatæ, distantes, latæ, albidæ, pallescentes.

In quisquiliis ad Mustiala m. Octobri, 1878.

Cæspitosa. Odor farinæ recentis. Pileus fusco-seu livido-pallens, umbone nigrescente, siccus expallens, 1-2 cm. latus. Stipes 2-4 cm. longus, 1-2 mm. crassus, basi subvillosus. Lamellæ venoso-connexæ. Cum *C. coracina* confluere videtur ideoque pro forma ejusdea sat singulari considerata.

4. *Coprinus inamoenus*. n. sp.

Pileus tenerimus, demum expansus, furfure denso micaceo obrotus, cinereo albus, disco subfusco, 2, 5 cm. latus. Stipes subæqualis, hyalino-albus, sericellus, 7 cm., longus, 1, 5 mm. crassus. Lamellæ collario e stipite remotæ, nigræ. Sporæ ellipsoideæ, fuscæ (s.l.), impellucidæ, longit. 7-11 mm., crassit. 4-6 mm.

Supra folia coacervata putrescentia in Mustiala m. Octobri, 1878, specimen unicum invenimus.

Odore iugrato, gravi (fere *Trichol. inamoeni*), facillime distinctus.

N.B.—*C. inamoenum* nuperrime legi. Odore gravissimo quam maxime fætidissimo; stipiteque proliero ab omnibus diversus.

5. *Cortinarius venustus*. n. sp.

Pileus carnosus, tenuis, convexus, obtusus, sericeus, dein disco innato-squamulosus, testaceo-pallens. Stipes æqualis, cavus, fibrillosus, violaceus. Lamellæ adnatæ, distantes, angustæ, ochraceæ, demum croceo-ochraceæ.

In pineto medio m. Septembris, 1878, in paroecia Tammela prope lacum Salvisjärvi.

A *Cortinario suillo*, Fr., affini, stipite longo, æquali, fere toto violaceo lamellisqve angustis, ochraceis differens. Caro pilei albida. stipitis sordide ochraceo-albida. Pileus vulgo irregularis, 7 cm. latus. Stipes subinde basi attenuatus, fibrillosus, vel floccoso-fibrillosus, basi alba excepta, violaceus, 12-19 cm. longus, 4 mm. crassus. Lamellæ basi venoso-connexæ. Sporæ ellipsoideæ, flavescentes (s. l.), longit. 7-8 mm., crassit. 4-5 mm.

6. *Hygrophorus grumatus*. (Fr.)

* *H. difformis*. Karst. n. subsp.

Pileus membranaceus, e plano-convexo versiformis, subumbilicatus, glaber, subinde demum rivuloso-squamulosus, lævis, aqrose albidus, siccus niveus, 1-4 cm. latus. Stipes e farcto cavus, æqualis, haud raro superne aut inferne inflatus, undulatus, glaber aut demum pallescens, tenax, 2-5 cm. altus, 2-7 mm. crassus. Lamellæ adnatæ, distantes, crassiusculæ, albæ, demum albo-pruinosæ. Sporæ sphaeroideæ, echinulatæ, hyalinæ, diam. 8-9 mm.

In clivo sub umbra *Salicis*, m. Septembri copiose legimus, in horto Mustialensi.

7. *Peziza Roumegueri*. n. sp.

Apothecia gregaria, sessilia, carnosa, orbicularia, plana, nuda, aurantio-lutea, extus margineqve distincto, membranaceo, tenui, erecto pallidiora, latit. 3-4 mm. Asci cylindracei, longit. circiter 240 mm. (pars sporifera 138 mm.), crassit circiter 12 mm. Sporæ 8: næ, monostichæ, fusideo-oblongatæ, 2-guttulatæ, læves, hyalinæ, longit. 24-27 mm., crassit. 9 mm. Paraphyses sat numerosæ, simplices, apice curvatæ, clavatæ, dilute aurantio-fulvæ, ope jodi, coerulescentes.

Supra terram humosam in paroecia Tammela fine mensis Maji initio-qve in Junii.

Extus *Pezizæ gemellæ*, setis neglectis, simillima, partibus vero internis cum *Pez. fusispora* sat conveniens. Paraphysibus solis jodo coerulescentibus statim dignoscenda.

8. *Phacidium Pyrolæ*. n. sp.

Spermagonia sparsa, epiphylla, immersa, epidermide lacerata tecta, vix 0, 5 mm. lata. Spermata cylindraceo, utrinque obtusa, recta, hyalina, simplicia, longit. 13-16 mm., crassit. 2-2, 5 mm.

Ad folia sicca nigrefacta *Pyrolæ rotundifoliæ* prope Helsingforsian vere olim legimus.

Spermagonia *Dothideæ latitanti* similia; fungus ascophorus nondum inventus.

9. *Exobasidium Ledi*. n. sp.

Receptaculum effusum, parenchymati foliorum innatum, in pagina superiori maculam flavescenti-pallidam efficiens, in inferiori hymenium flavesceus, albopulverulentum explicans, orbiculare, ellipsoideum vel oblongatum, sparsum, raro confluens, latit. 1-4 mm. Sporæ fusosidei-oblongatæ, rectæ, longit. 4-6 mm., crassit. circiter 1 mm. Prope Mustiala in foliis *Ledi palustris* m. Julio.

CRYPTOGAMIC SOCIETY OF SCOTLAND.

The fourth annual meeting of this Society was held at Edinburgh on the 9th, 10th, and 11th October, under the presidency of Professor Balfour. At a public meeting in the Lecture Hall of the Botanic Gardens, the President, in an opening address, gave a sketch of the life and labours of the late Dr. Greville, and a great number of his original drawings were exhibited. Subsequently papers were read on topics connected with the Society, notably one by Dr. Isaac Bayley Balfour on a new Myxomycete, which Professor de Bary had named *Cribraria Balfouri*, DBy. Specimens of the new *Hygrophorus Wynnii*, B., were exhibited on behalf of the Rev. M. J. Berkeley. Other drawings and specimens were on the table, including those found in Inverleith House, the new residence of the Regius Keeper, viz., *Peziza Adæ*, Sadl., *Peziza cretea*, Cke., *Peziza tectoria*, Cke.

In the evening the members met at the annual dinner, and on the morrow an excursion was organised to Penicuik woods, which was highly enjoyed by all who took part in it.

The specimens collected and those sent in, including the contents of twenty to thirty boxes and hampers, were arranged in the Herbarium Hall and Winter Garden, at the Botanical Gardens, and the exhibition was visited on the Friday and Saturday by large numbers of the inhabitants of Edinburgh and its vicinity. It was the first exhibition of the kind ever held in that city, and consequently excited considerable interest.

Of species not previously recorded as occurring in Scotland were *Agaricus inamænus*, Fr., *Agaricus innectus*, Fr., *Agaricus Phillipsii*, B. & Br., *Cortinarius decoloratus*, Fr., *Russula Queletii*, *Hygrophorus russocoriaceus*, B. & M., *Cynophallus caninus*, Fr., *Peziza theleboloides*, A. & S., *Hypomyces rosellus*, Tul., *Nectria Albertini*, B. & Br., *Nectria Rousseliana*, M.

The Rev. Jno. Stevenson brought *Polyporus roseus*, Fr., and *Agaricus scobinaceus*, Fr., from Glamis. The Rev. James Keith sent *Hydnum imbricatum*, L., and *Hydnum fragile*, Fr., from Forres; and the Rev. Mark Anderson brought *Peziza ammophila*, D.R. & Lev., and *Agaricus ammophila*, Mont., from St. Andrews, The Rev. M. J. Berkeley sent the new *Hygrophorus Wynnii*, B. & Br.

Amongst other specimens of interest was a very large *Lycoperdon giganteum*, Batsch. Some magnificent *Polyporus giganteus*, Fr., and one very fine mass of *Polyporus intybaceus*, Fr. Very large specimens of *Helvella lacunosa* were found at Penicuik, one of which was five inches high and six inches in circumference. Beautiful clusters of *Clavaria amethystina*, Fr., and a mass of *Clavaria stricta*, Fr., extending seven or eight inches in both directions, were exhibited. *Hygrophorus calyptræformis*, B. & Br., of the normal colour, was accompanied by a pure white variety.

Of species entirely new to the British Isles were *Agaricus* (*Crepidotus*) *calolepis*, Fr., and *Craterium Friesii*, R., the latter found by Mr. W. Phillips in Hawthornden. A species of *Nectria*, growing in large patches on the naked ground at Penicuik, is probably new. In order to facilitate study one portion of the collection was named and displayed in scientific sequence; the other portion being grouped as a popular exhibition and displayed with a view to effect. In both sections there were also named collections of the edible and poisonous species.

Many species of interest were exhibited, and the whole mass of specimens sent in was exceedingly large. The whole available time between the arrival of the hampers and the opening of the exhibition was occupied by the experts in naming and labelling the specimens, and arranging them in their proper groups; hence little or no time was left for them to look over, much less examine and decide upon critical or doubtful individuals. A few hours after the opening of the exhibition and most of the English mycologists were on their way home, their only regret being that the work of the meeting commenced so late in the week; that it was impossible, in the two or three hours which intervened between the close of their work in preparing for the exhibition and the departure of inexorable trains, to study the mass of Fungi which had been brought together. As it was, the indefatigable local secretary, Mr. J. Sadler, to whom so much of the success of the exhibition was due, after working through two nights, broke down, and had to take to his bed, with an attack of pleurisy. This was the only circumstance which occurred to throw a shadow across the bright course of events during the few days of the first meeting of the Scottish cryptogamists with their English friends in "Auld Reekie."

Next year's meeting will be held at Forres, but there will be no exhibition on that occasion.

As an outcome of the meeting, we have heard intimations of the probability of a local Cryptogamic Club being started for Edinburgh and its vicinity. Of course, we wish the project every success, if attempted, on the principle of "the more, the merrier," or perhaps still better, "the more, the wiser."

NEW DIATOMS.

By Professor P. T. CLEVE, with Notes by F. KITTON,
Hon. F.R.M.S.

Professor P. T. Cleve, in a paper communicated to the Royal Swedish Academy of Sciences (Vol. v., No. 8, 1878), has figured and described the following new species of Diatomaceæ. These forms, Herr Cleve informs us, were principally obtained during his travels (in 1868) in the West Indian Archipelago, from the Virgin Islands, and along the shores of St. Bartholomew. Those from Campeche Bay are figured and described by permission of Herr Grunow, of Vienna.

The number of species identified in these gatherings amounts to 177, of which 25 are considered by the author to be new.

1. **Navicula Virginea.** *Cl.*—This form varies somewhat as to outline, being often slightly constricted at the centre. Apices produced. Median pores* approximated. Striæ very fine, only visible in balsam-mounted specimens, by oblique light. The striæ are parallel, and not interrupted. This form seems to be closely allied to *N. Janischiana*, Rab. Virgin Islands (not rare).

2. **N. Regula.** *Grun. & Cl.*—S. V. rectangular, with parallel margins. Striæ coarse, radiant, reaching median line, abbreviate in the middle, about 7 in .01 mm. Median pores somewhat distant, median lines almost straight. Length .0884 mm., breadth .0136 mm. Virgin Islands. Campeche Bay. Herr Grunow. (Professor Cleve thinks it may possibly be a var. of *N. rectangulata*, Greg. I have seen the Campeche Bay form, and do not observe any specific distinction to warrant its separation from Gregory's species.—F. K.)

3. **N. St. Thomæ.** *Cl.*—Valves undulate, apices produced, striæ coarse, radiant, marginal, shorter as they approach the central nodule, 5-6 in. L. .01 mm., .061 mm., B. .0255 mm. This form, according to Herr Grunow, is allied to his *N. Botteriana*. Virgin Islands (one specimen only).

4. **N. Bartolomei.** *Cl.*—Valves strongly constricted at the middle ends, cuneate. Sculpture; large parallel costæ, not reaching either margin or median line. Short round the central nodule. The margins have a small row of small granules, L. .075. St. Bartholomew. (Herr Cleve thinks this may be identical with my *N. Perryana*. T. M.S., 1873, with which I am inclined to concur.—F. K.).

5. **N. formicina.** *Grun. in "Litt."*—Valve composed of two rhombic halves, connected by a very narrow isthmus, which is slightly enlarged in the middle. Striæ parallel, not reaching the

* By median pores is meant the nodules or openings which terminate the median lines, more or less near the centre of the valve.

median line, and wanting in the middle of the valve, very delicately punctate, 6 in., .01 mm. L. .057 mm. B. of lobes .012 mm., of isthmus, .004-.005 mm. Campeche Bay.

(I have seen a similar form from the Sulu Archipelago, differing from the Campeche form by being about twice the size, and the striae being interrupted.—F. K.)

6 **N. Goesii.** *Cl.*—Valves elliptical, with produced subcapitate ends. Striae distinct, 14 in. .04 mm, reaching median line parallel, slightly radiant at the apices, longitudinal striae slightly wavy. L. .07 mm. B. .024 mm. St. Bartholomew.

7. **N. (Brebissonia) (?) Weissflogii.** *Grun. in "Litt."*—Valve broad, rhombic, lanceolate, with obtuse ends. Central nodule linear, oblong, slightly constricted in the middle; terminal nodules somewhat distant from the ends of the valve. Striae radiating, punctate, 12.5-15 in. .01 mm, reaching the narrow median line. L. .085 mm. B. .03 mm. Campeche Bay. (This form was not unfrequent in Capt. Perry's Colon gathering.—F.K.)

8. **Alloioneis (?) Gründleri.** *Cl. & Grun.*—Valve broadly linear, oblong, with cuneate apices; median line very excentric, somewhat arcuate, central nodule transversely dilated. Striae distinctly punctate, transverse, reaching median line. 11 in., .01 mm. L. .075 mm. B. .028. Virgin Islands (very rare). Campeche Bay, Grun. Colon, Kitton.

9. **A. (Navicula) ? Antillarum.** *Cl. & Grun.*—Valve elliptic, oblong, median line a little excentric and curved. Striae composed of large distinct puncta, arranged in somewhat irregularly decussating oblique lines. The striae on one side of the valve nearly reaching the median line, leaving only a small area round the central nodule, on the other side the striae are much shorter, leaving a semi-lanceolate blank space. L. .12 mm. S. Bartholomew (rare). Gulf of Mexico, Grun.

10. **Navicula (Alloioneis) ? Kurzii.** *Grun.*—Valve broad, lanceolate, median line excentric, curved surrounded by an excentric blank space, which is irregularly enlarged in the middle, and becomes narrower at the ends. The rest of the valve is covered with granules like those on *N. aspera*, forming decussating oblique lines, and more narrow transverse ones 10-11 m. .01. The transverse lines reach as far as the median line, if seen under a high power. L. .09-.105 mm. B. .036 mm. Mangrove swamps, Elephant Point, East Indies.

11. **N. (Alloioneis) ? curvinervia.** *Grun.*—Valve oblong or lanceolate, with obtuse ends, median line excentric. Striae (costae ?) slightly radiating, not reaching the median line, interrupted by two sharp longitudinal bends of the valve, smooth (under a very high power and favourable, delicately punctate), 8-9 in., .01 mm. L. .068-.115 mm. Br. .022-.028 mm. Mangrove Swamps, Elephant Point, E. Indies.

12. **Rhoicosigma Antillarum.** *Cl.*—Median line sigmoid very elevated on the one half of the valve, where it forms a crest impressed on the other half. Striæ distinct, transverse, 14-15 in. $\cdot 01$ mm. L. $\cdot 425$ mm. Virgin Islands (rare).

12. **Plagiogramma (decussatum var. ?) Antillarum.** *Cl.*—Valve elliptical, extremities broadly rounded; interior septæ 4, 2 near the ends, 2 in the centre; puncta in transverse and longitudinal rows; transverse, 8-9 in. $\cdot 01$ mm. L. $\cdot 07$ - $\cdot 08$ mm. Virgin Islands (rare). *P. caribæum*, *Cl.* Outline resembling *P. lyratum*, Greville. Interior septæ 4, 2 near the ends, 2 in the middle. The two central septæ are connected with the end septæ by a strong median rib and by two others following the margin of the valve. Puncta or granules arranged in distinct parallel transverse rows, 8-9 in., $\cdot 01$ mm. L. $\cdot 012$ - $\cdot 088$ mm. Virgin Islands.

14. **P. attenuatum.** *Cl.*—Valve small, lanceolate acute ends, slightly rounded. Septæ 2 central and 2 near the ends. The two central septæ form, in the middle, a rounded quadrangular annulus, puncta arranged in parallel transverse 10 in. $\cdot 01$ mm. L. $\cdot 05$ mm. St. Bartholomew (very rare).

15. **Nitzschia (Sigma var. ?) valida.** *Cl. & Grun.*—Valves slender, almost straight, sometimes more or less sigmoid, with cuneate ends. Punctæ about 4 in. $\cdot 01$ mm. Striæ distinct, 18 in. $\cdot 01$ mm. Virgin Islands (very rare). Campeche Bay, Grunow. Sulu Archipelago, Kitton.

16. **N. (Jelineckii var.) acuta.** *Cl.*—This form greatly resembles *N. Jelineckii* of Grunow (= *N. decora*, Kitton. Grunow's sp. name having the priority, mine must be deleted), but its ends are cuneated and pointed. The ends are connected by a very sharp and visible keel. Striæ distinct, 11 in. $\cdot 01$ mm. Virgin Islands (not rare).

17. **N. (longissimus var. ?) curvirostris.** *Cl.*—(This form only differs from *N. longissima* by the horns being curved in the same direction, and from *N. ventricosa* by the fineness of the striæ; the curvature is of no distinctive value; in mounting selected specimens of *N. ventricosa*, the horns may be placed in any position.—F. K.) St. Bartholomew (only one specimen).

18. **N. (Perrya) Weissflogii.** *Grunow.*—Valves resembling a long and very narrow boat, with a sharp keel, smooth or covered with minute, irregularly-scattered granules, which form coherent longitudinal rows only on the keel, and near the margin of the valve; the keel is besides marked by a row of sharp transverse bars, which (as in all other *Nitzscheæ*) lie in the interior side of the valve, and are fastened to each side of it. L. $\cdot 155$ - $\cdot 32$ mm. Campeche Bay, Grunow. Colon, Kitton.

Var. a, subglabra, valves almost smooth.

Var. β, sparsa, valves covered with irregularly scattered minute granules.

Var. γ, interrupta, keel bars lengthened and interrupted two or three times. Colon, F. K.

19. **N. (Perrya) Gründleri.** *Grun.*—Resembles *N. Weissflogii*, but the valve seems more excentric and is covered with parallel transverse punctate striæ, 12-14 in .01 mm. The valves, which are more or less constricted in *N. Weissflogii* are straight in *N. Gründleri*. Campeche Bay, Da Gründler; Colon, Kitton.

The forms composing my genus *Perrya*, of which *P. pulcherrima* is the type, differ widely from the *nitzschia* in the structure of the frustule. A figure of the frustule is given in the M. M. J. vol., and an ideal section of the valve, the latter is incorrect. I have since succeeded in obtaining a correct outline; the valves in Plate 120, Fig. 5, Figure 2, are reduced copies of a camera lucida drawing. Fig. 1 is also a reduced copy of a camera lucida drawing of the s. v., as seen at about *a*, Fig. 2. The granules are irregular in outline, and slightly hispid, by very careful focussing the extreme edge of the valve may be seen.

Fig. 3 is a diagrammatic section of a frustule of *Nitzschia grandis*.—F. K.

20. **Tryblionella Lanceola.** *Grun.*—Valves lanceolate, costæ strong, pervious, 10 in .01 mm. L. .05 mm. St. Thomas.

(In Cleve's figure the costæ are represented in pairs, which gradually approach each other until they unite at the centre of the valve.—F. K.)

21. **Denticula ? Antillarum.** *Cl. & Grun.*—Valves lanceolate, with acute ends. Costæ 7-12. Spaces between the costæ, with irregularly scattered puncta. L. .05-.063 mm. Not very rare in the St. Bartholomew gathering; it also occurs in brackish mud from Santos, Brazil. (Judging from the figure, I think this form may be a species of M. Petit's *Trachysphenia*. "Fonds de la Mer," Vol. iii., pl. v., fig. 19.)

22. **Grammatophora (macilenta var.?) caribæa.** *Cl.*—Valve with distinctly gibbous centre and ends. Septæ straight. Striæ fine, 28 in .01 mm., distinctly punctate. Virgin Island (common).

23. **Triceratium Campechianum.** *Grun. in "Litt."*—No description is given by Prof. Cleve of this beautiful little species, and his figure is copied from a photograph. It occurred somewhat plentifully in the Campeche Bay gathering. I also found one or two valves in that from Colon. The following are its specific characters:—

Valves polygonal (8-10 angles), processes on the alternate angles, cellules hexagonal, usually largest at the centre, diameter .70-.107 mm. Campeche Bay. The 8-angled var. I found in some washings of Algae from Barbadoes (one specimen only), diameter .62 mm. The cellules resemble those in *T. Farus*.—F. K.

24. **T. (or Biddulphia) bicorne.** *Cl.*—Valve rhombic, two of the opposite angles much produced, upon which the processes are situ-

ate, the other angles being without them. Cellules irregularly hexagonal. Margins striate; connecting membrane finely punctate. Distance between the angles $\cdot 059$ mm. St. Bartholomew.

New Forms found in a Barbadoes Gathering.

25. **Nitzschia Graffei.** *Grun. MS.*—Valves broad, with cuneate and rounded ends, almost parallel sides, slightly constricted at centre. Striæ strong, 10 in. $\cdot 10$ mm., moniliform. Marginal puncta 5 in. $\cdot 01$ mm. L. $\cdot 127$ – $\cdot 14$ mm.

This form occurs in a gathering from Samoa and Port Jackson (I have also found it in gatherings from the following localities:—Jamaica, Bahia and Pisagua.—F. K.)

26. **Biddulphia membranacea.** *Cl.*—Valve elliptic, with rounded ends. F. V. quadrangular. Valve very large and membranaceous. The markings consist of very small cellules, arranged in lines crossing each other in three directions; the lines are about 8 in. $\cdot 01$ mm., parallel on the middle of the valve, but somewhat radiant near the ends. The connecting membrane is covered by elongated puncta, arranged in lines somewhat coarser than those on the valve. L. 26. B. $\cdot 085$ mm. I have also found it in a gathering from Honolulu. (? a variety of *B. baleua*.—F. K.)

27. **Actinocyclus? tenuissimus.** *Cl.*—Valve circular, with a row of marginal puncta. Marginal nodule distinct. Sculpture very delicate, granules arranged in lines, radiating from the centre. Diam. $\cdot 04$ – $\cdot 08$ mm.

(Prof. Cleve refers *Amphiprora? complexa* to Castracane's genus *Amphitrite*; this form, however, does not belong to either genus, but is a true *Palmeria*. See "Grevillea," Vol. iii., p. 39.—F. K.)

CALIFORNIAN SPHÆRIÆ.

By CHARLES B. PLOWRIGHT.

The following enumeration of Sphæriaceous fungi is the result of several parcels of specimens, collected in California by my friend, Dr. H. W. Harkness. The majority were obtained by this gentleman and Mr. J. P. Moor upon the Sierra Nevada Mountains. Many of the species occurred at a considerable elevation above the sea level—4,500 to 5,000 feet. Some very interesting species occur upon the celebrated "big trees" (*Sequoia gigantea*) in the Yosemite Valley, while others equally novel were found upon *Sequoia sempervirens*. Amongst the species new to science the more striking are *Sphæria megalocarpa*—a plant with very large perithecia—*Sordaria californica*, and *Gnomonia alni*. Several of the more common European species occur in apparant abundance, while the growth of *Sordaria bombardioides* indicates that our less common species are not confined to this hemisphere.

Hypocrea rufa. *Fr.*—No. 561. Pale form, with conida (*Trichoderma viride*), on alder (898).

Hypocrea lenta. *Fr.*—On wet fir chips (465).

Hypomyces aurantius. *Tul.*—On various *Polypori* (608, 616, 624).

Hypomyces rosellus. *Tul.*—No. 570.

Nectria cinnabarina. *Fr.*—On *Æsculus californica* (1048), the conidial form; on *Sambucus* (1055), on *Oreodaphne californica* (1047).

Nectria cucurbitula. *Fr.*—On fir bark (1007).

Nectria episphæria. *Fr.*—No. 924.

Nectria peziza. *Fr.*—Nos. 526, 527.

Hypoxyton malleolus. *B. & Rav.*—On *Populus pyramidalis* (1089).

Hypoxyton fuscum. *Fr.*—On oak (950).

Hypoxyton rubiginosum. *Fr.*—With brilliant orange conidia, on *Oreodaphne californica* (483).

Hypoxyton serpens. *Fr.*—On dead *Oreodaphne californica* (514).

Nummularia Bulliardi. *Tul.*—On oak (573, 613), on *Oreodaphne* (973).

Diatrypella tocciana. *De Not.*—On alder (929).

Diatrype disciformis. *Fr.*—No. 574; on oak (906).

Diatrype bullata. *Fr.*—On black oak bark (959).

Valsa sordida. *Fr.*—On poplar (spermogonia) (295).

Valsa salicina. *Fr.*—On willow (749, 946).

Diaporthe arctii. *Nke.*—On wild parsnip (909).

Sordaria fimicola. *Rob.*—On old horse dung.

Sordaria bombardioides. *Arn.*—On horse dung. Mount Shasta (953).

Sordaria californica. *Plow.*—Perithecia large, covered with a dusky brown felt, superficial, crowded or scattered, about 1 mill. high; ostiolum naked, rugose, often thrown into parallel-diverging striae; sporidia elliptico-fusiform, lower end truncate, appendiculate, $.03-.035 \times .015-.018$ mm.; asci about $.2-.3$ mm. long. (Plate 120, fig. 2.)

On cow dung (513). A very well-marked and interesting species. The sporidia are developed from cylindrical bodies, as in *Sordaria coprophila*.

Sphæria canescens. *Pers.*—No. 880; on dead pine (964).

Sphæria moriformis. *Tode.*—On hazel (904), on dead *Oreodaphne* (975).

Sphæria megalocarpa. *Plow.*—Perithecia superficial, very large, 3 mill. in diameter, spherical, dull black, slightly rough, becoming rugulose with age; ostiola very minute, scarcely prominent, surrounded by a paler areola; asci cylindrical or clavate, $\cdot 07\text{--}\cdot 13 \times \cdot 01\text{--}\cdot 015$ mm.; sporidia dark brown, oval, colourless when young, then binucleate, $\cdot 012\text{--}\cdot 015 \times \cdot 003\text{--}\cdot 005$ mm.; paraphyses numerous, flexuose. (Pl. 120, fig. 1.)

On the bark of dead maple (956).

This is a very remarkable species on account of the large size of its perithecia, which vary from $1\frac{1}{2}$ to 3 mm. in diameter, scattered or crowded; when occurring in latter condition the perithecia are mutually compressed.

Sphæria pulvis-pyrius. *Pers.*—On dead pine (986).

Sphæria myriocarpa. *Fr.*—No. 627; on *Sambucus* (944), on *Pinus contorta* (1015), on willow (1022), on decorticated black ash (1042).

Sphæria arctostaphylos. *Plow.*—Perithecia irregular, unequal in size, flattened, subrotund, collapsing, superficial; ostiola almost obsolete; asci clavato-pyriform, $\cdot 07 \times \cdot 015\text{--}\cdot 02$ mm.; sporidia simple, ovate, somewhat curved, hyaline, $\cdot 015\text{--}\cdot 018 \times \cdot 004\text{--}\cdot 005$ mm.

On bare wood of *Arctostaphylos glaucus* (617). Perithecia accompanied by pycnidia, which contain a mass of phoma-like spores, oval, hyaline, $\cdot 003\text{--}\cdot 004 \times \cdot 001$ mm.

Sphæria sequoiæ. *Plow.*—*Pycnidia* rather large, gregarious, subimmersed; spores hyaline, oval, binucleate, $\cdot 003\text{--}\cdot 004$ mk.

Perithecia rather large, immersed then suberumpent, seated on bleached spots; asci cylindrical; sporidia hyaline, obscurely trisepate, slightly unequal, the upper half being the larger, $\cdot 025\text{--}\cdot 03 \times \cdot 008\text{--}\cdot 01$.

On dead bark of *Sequoia gigantea* (634). Nos. 654 and 665 appear to be conditions of the same fungus.

Sphæria confertissima. *Plow.*—Perithecia minute, densely crowded in patches, more scattered circumferentially, mutually compressed, subspherical; asci cylindrical, $\cdot 01\text{--}\cdot 008 \times \cdot 01\text{--}\cdot 015$; sporidia biseriata, unisepate, hyaline subequal, $\cdot 0015\text{--}\cdot 002 \times \cdot 005$ mm.

On cones of *Sequoia sempervirens* (861).

Sphæria sustenta. *Plow.*—Perithecia immersed; ostiola bursting between the bleached fibres of the matrix; asci cylindrical, $\cdot 15 \times \cdot 015\text{--}\cdot 010$; sporidia ovate, dark brown then black, $\cdot 02\text{--}\cdot 025 \times \cdot 01\text{--}\cdot 011$ mm.

On bleached stems of *Arctostaphylos* (381).

Sphæria propagata. *Plow.*—Perithecia in lines, erumpent then superficial, middle sized sometimes confluent; ostiola distinct, papillate; asci cylindrical, $\cdot 05\text{--}\cdot 06 \times \cdot 008\text{--}\cdot 011$ mm.; sporidia 8 hyaline, sausage-shaped, $\cdot 008\text{--}\cdot 01 \times \cdot 002\text{--}\cdot 003$.

On grape cuttings (1053).

Sphæria commanipula. *B. & Br. (?)*—In bad condition, on stems of indigenous spikenard (960).

Sphæria herbarum. *Pers.*—On white sage (941), on soap plant stems with sixteen sporidia in each ascus (707).

Sphæria (= leospora) sambuci. *Plow.*—Perithecia as in *Sp. herbarum*; asci cylindrical, $.08 \times .01$ mm.; sporidia ovate, transversely triseptate, longitudinally incompletely uniseptate, pale yellow, $.012-.014 \times .004-.005$ mm.

On *Sambucus* (939). The sporidia resemble those of *Pl. Bardanæ*, Niessl. Beitr., p. 18, t. iv., f. 4.

Sphæria permunda. *Cooke.*—No. 539.

Sphæria rubella. *Pers.*—On wild parsnip (909).

Gnomonia alni. *Plow.*—Parasitic. Perithecia minute, in clusters, buried in the substance of the leaf; ostiola elongate, slightly tapering at the apex; asci ovato-elongate, $.035-.04 \times .01-.015$ mm.; sporidia 8 hyaline, curved, uniseptate, nucleate, $.022-.025 \times .003-.004$. (Pl. 120, fig. 4.)

On living leaves of *Alnus* (743). The bases of the perithecia project slightly upon the opposite surface of the leaf, throwing the epidermis into minute tubercles.

Venturia sequoiæ. *Plow.*—Perithecia unequal, scattered, setulose superiorly; asci cylindrical, $.07 \times .01$ mm.; sporidia 8, linear, triseptate, somewhat unequal in length, faintly triseptate, hyaline. (Pl. 120, fig. 3.)

On decaying foliage of *Sequoia gigantea* (650).

HYGROPHORUS FŒTENS. *Nov. spec.*

By WILLIAM PHILLIPS, F.L.S.

A very distinct species of *Hygrophorus* has occurred this autumn on the earth in the General Cemetery of this town (Shrewsbury), in considerable abundance, which appears to be hitherto undescribed. It may be distinguished as follows:—

Hygrophorus fœtens. n. s.—Fœtens, fragilis, pileo atro-brunneo, sub-carnoso, a convexo applanescente, glabro, demum diffractosquamuloso; stipite farcto, nitido, deorsum attenuato, pallidiore; lamellis decurrentibus, distantibus, crassiusculis, pileo sub-concoloribus aut pallidioribus, sub glauco-pruinosis.

On the earth amongst grass. Shrewsbury, Nov., 1878.

The pileus is about one inch across, the stem from one to three inches long and two lines thick. The odour is very similar to that of *Thelephora fastidiosa*. The whole plant is of a dark-brown colour, the stem and gills somewhat paler. It is not at all viscid, and though fragile must stand in Fries' sub-genus *Camarophyllus*, in the first section, Tab. 121, fig. B.

Several species of *Hygrophorus*, usually considered rare, have occurred here abundantly this autumn, especially the beautiful *H.*

calyptræformis, the pretty *H. miniatus*, and the remarkable glutinous *H. unguinosus*.

NOTE ON THE ABOVE.

As the opinion expressed by Dr. Quelet, that the *Hygrophorus fætens* is the same as *Agaricus atropunctus*, Pers., seems to demand reconsideration, we offer these suggestions:—

I.—Is the *Agaricus* known to Dr. Quelet under the name of *atropunctus*, the same as that so known in this country?

II.—If this be established, on what grounds is the identity maintained?

The following differences must be reconciled:—*Ag. atropunctus*, P. ("Journ. Bot.," t. 161, f. 13), has flesh-coloured gills and pink spores. The *Hygrophorus* has pruinose brown (umber) gills, and white spores.

The *A. atropunctus* is always without appreciable odour, whilst the *Hygrophorus* in all stages is fœtid.

The *A. atropunctus* has a pallid pileus, with a cinereous tinge, the *Hygrophorus* is of a decided warm-brown. In the latter, the pileus, when old, cracks concentrically, so as to resemble scales, whilst the former remains entire and without fissure.

The stem in *A. atropunctus* is sprinkled with black punctate scales. That of *Hygrophorus* is quite smooth, only, when becoming old or dry, with a tendency to crack concentrically, so as to expose the paler flesh beneath the cuticle.

The greater thickness of the gills in the *Hygrophorus*.

The difference in the size of the spores, which are '004 mm. in the one, and '005 or '006 mm. in the other.

The difference in habitat of the two species.

Dr. Quelet says that our *Ag. atropunctus* is his *Omphalia atropuncta* (junior), and the *Hygrophorus* is his *Omphalia atropuncta* (vetustior). But as the youngest specimens of the *Hygrophorus* have the colour and all the features of the mature plants, and *not* the colour or punctæ of the *Ag. atropunctus* (although some hundreds have been collected this year), that objection will not hold.

The difference in colour Dr. Quelet attributes to different meteorological conditions which accounts for "the variable colour—pale yellow, grey, bistre-brown." This would entirely revolutionize our ideas of classification, if true that it means white spores or rosy spores are dependent on meteorological conditions; as to the colour of the plant itself (the pileus and stem), we admit variation within reasonable limits. This variation, however, should be discussed in its relationship to same undisputed plant, and not brought forward as a plea for two species so different as the above. There are some much more important distinctions to be accounted for before we can accept the two species as identical.

If the colour of the spores in *Agaricini* is as mutable as Dr. Quelet would have us believe, then the whole classification of the *Hymenomycetes* rests on a false basis, and must be swept away. At

present the evidence is strongly in favour of their permanency, notwithstanding any meteorological *disturbances*.

We have prepared a plate containing the following figures, which will be issued in our next number:—

- Pl. 121, fig. A. *Hygrophorus Wynnæ*, *B. & Br.*
 B. *Hygrophorus fætens*, *Phil.*
 C. *Agaricus atropunctus*, *Pers.*
 D. *Agaricus Phillipsii*, *B. & Br.* M. C. C.

CRYPTOGAMIC LITERATURE.

PIM, GREENWOOD. The Fungi of the Counties of Dublin and Wicklow.

PIM, GREENWOOD. The Lichens of the Counties of Dublin and Wicklow.

GAROVAGLIO, S., AND CATTANEO, A. Studi sulle dominanti malattie dei Vittigni.

CATTANEO, A. Sull' *Acremonium Vitis*.

CATTANEO, A. Sullo *Sclerotium Oryzæ*.

CATTANEO, A. Due nuovi miceti parassiti delle Viti.

NYLANDER, W. *Symbolæ quædam ad lichenographiam Sahariensem*, in "Flora," August 1, 1878.

THUMEN, F. A. *Fungi Austro-Africani*, No. vi., in "Flora," August 11, 1878.

ARCANGELI, G. Sulla *Fistulina Hepatica*, in "N. Giorn. Bot. Ital.," October, 1878.

RABENHORST, L. *Einege neue Pilze und Algen*, in "Hedwigia," August, 1878.

GEHEEB, A. *le Philonotis capillaris*; Quelques Mousses des Montagnes Rhén; Mousses Nouvelles de l'Afrique Meridionale, in "Revue Bryologique," No. 5, 1878.

RABENHORST, L. *Fungi Europæi*. Cent. xxv.

COOKE, M. C. AND QUELET, L. *Clavis Synoptica Hymenomycetum Europæorum*.

COOKE, M. C. The Fungi of Texas, in "Annals of N. Y. Academy of Sciences," Vol i., No. 6.

THUMEN, F. DE. *de Fungis Entrerianis Observationes* (reprint).

THUMEN, F. DE. *Mycotheca Universalis*. Cent. xii.

THUMEN, F. DE. *Bietrage zur Pilz-Flora Sibiriens*. Part ii.

ELLIS, J. B. *North American Fungi*. Cent. i.

KARSTEN, P. A. *Symbolæ ad Mycologiam Fennicam*. III. and IV.

SMITH, H. L. New Species of Diatoms, in "Amer. Quart. Micro. Journal," No. 1.

HINE, F. B. Observations on *Saprolegnieæ*, in "Amer. Quart. Micro. Journal," No. 1.

COOKE, M. C. Fungi of Texas, in "Journ. Linn. Soc.," No. 99.

STIRTON, DR. J. Remarks on Mr. Crombie's paper on "Challenger," Lichens, in "Journ. Linn. Soc.," No. 99.

SCHMIDT, A. *Atlas der Diatomaceenkunde*. Parts xv., xvi.

Grevillea,

A QUARTERLY RECORD OF CRYPTOGAMIC BOTANY
AND ITS LITERATURE.

BRITISH SPHÆRIACEI.

By M. C. COOKE and C. B. FLOWRIGHT.

So many additions and corrections require to be made to the Sphæriacei, published in the "Handbook of British Fungi," that we have deemed it expedient to prepare a synopsis of the additional species, with a few of the most important corrections and references to the descriptions. As to the vast number of new genera now in vogue with many of the continental mycologists, we regret that we cannot accept them. We prefer adhering to a *natural* system, with all its difficulties or failings, to reverting to an artificial system, or a medley of several systems, the most to be said in their favour being the facility they offer for the manufacture of new genera and species, which, if logically persevered in, must end in inextricable confusion. Such genera, or sub-genera, as we have introduced, are based on other than carpological characters, which latter we hold to be as insufficient as they may be seductive. When we state that we are not prepared to accept the sporidia as a basis of classification (except for the artificial grouping of the species in a genus), this must be held as sufficient apology for the absence of "startling novelties."

A. NECTRIÆI.

Gen. 1. **TORRUBIA.** Tul.—Cooke Hdbk., p. 769.

No additions, or corrections, except that

Torrubia pistillariæformis. B. & Br. was undoubtedly growing on a female *coccus*, transformed into a body resembling a sclerotium by the mycelium. We have received identical specimens from the United States, in which the *coccus* was less changed.

Gen. 2. **CLAVICEPS.** Tul.—Handbk., p. 772.

Gen. 3. **EPICHLÖE.** Fr.—Handbk., p. 773.

Gen. 4. **HYPOCREA.** Fr.—Handbk., p. 774.

Hypocrea contorta B & C.—Grev. iv., p. 123 —On oak stick.

Hypocrea pulchra (*Hypocreopsis Pulchra*. Wint.)—Grevillea iv., 123. Plow. S.B. ii., No. 100. On sheep dung.

The genus *Hypocreopsis* is supposed to differ from *Hypocrea* in having a tomentose surface to the stroma, but this is not an uncommon feature in many species of exotic *Hypocrea*, and is at best only a sectional distinction, or sub-generic. Old specimens become quite smooth, in which case the generic distinction would be lost, and hence confusion would ensue.

Gen. 5. **HYPOMYCES**. Tul.—Handbk., p. 776.

Gen. 6. **OOMYCES**. B. & Br.—Handbk., p. 776.

Gen. 7. **ACROSPERMUM**. Tode.—Handbk., pp. 430.

The long filiform sporidia are contained in asci, and, therefore, this genus is allied to *Oomyces*.

AcrospERMUM compressum. Tode.—Hdbk., No. 1,257. On nettle stems, &c.

AcrospERMUM graminum. Lib.—Hdbk., No. 1,258. On dead grasses.

Gen. 8. **NECTRIA**. Fr.—Handbk., p. 780.

Sub-genus I. **TUBERCURELLA**. C. - Perithecia cæspitose, on an erumpent stroma, often at first some species of *Tubercularia*. Nos. 2,345 to 2,353.

Nectria citrino-aurantia. Desm.—Berk & Br. Ann. Nat. His. No. 1,493. On willow.

Nectria mammoidea. Ph. & Pl.—Grevillea iii., p. 126. Plow. S.B., ii. No. 5. On furze.

Sub-genus II. **BYSSONECTRIA**.—Perithecia seated on a more or less distinct subiculum. Handbook, No. 2,355, 2,364.

Sub-genus III **TRICHONECTRIA**.—Perithecia villose, or tomentose. Handbk., Nos. 2,354, 2,356, 2,357, 2,369.

Sub-genus IV. **GENUINA**.—Perithecia naked, superficial, scattered, or gregarious. Handbk., No. 2,358 to 2,368, 2,370.

Nectria Keithii. Berk & Br.—Ann. Nat. Hist. No. 1,625. On cabbage stalks.

Nectria Plowrightiana. Sacc. in *Michelia*.—Plow. S.B. iii., No. 15. On stems of *Arctium lappa*.

Nectria lecanodes. Ces.—Grevillea vi., p. 25. Plow. S.B. ii., No. 12. On *Peltigera*.

Nectria peltigeræ. Ph. & Pl.—Grevillea vi., p. 123. Plow. S.B. ii., No. 13. (= *Nectriella carnea*. Fekl.) On *Peltigera*.

Sub-genus V. **CRYPTONECTRIA**.—Perithecia at first covered, then erumpent.

Nectria caulina. *Cke.*—Grevillea v., p. 62, Fung. Britt., ii., No. 479. On twigs of *Buxus*.

Gen. 9. MELANOSPORA. Corda.

Included in Handbook as *Ceratostoma*, Fr., but as this latter name is applied also to a section of *Sphæria*, the above may be substituted, especially as it is in general use.

Melanospora caprina. *Fr.*—Handbk., No. 2,786.

Melanospora Zobelii. *Corda.*—Handbk., No. 2,787.

Melanospora Helvellæ. *Cke.*—Grevillea i., p. 175.

B. DOTHIDIÆI.

Gen. 1. POLYSTIGMA. Pers.—Handbook, p. 803. Handbk., Nos. 2,410-2,411.

Gen. 2. DOTHIDEA. Fr.—Handbook, p. 804.

Sub-gen. 1. GENUINA.—Erumpent, pulvinate, growing on twigs and stems. Handbook, Nos. 2,422 to 2,425.

Dothidea sambuci. *Fr.*—Sys. Myc. ii., 551. Erumpent, orbicular, flattened, black, cinereous within; sporidia oblong, uniseptate, 0.18×0.08 mm. On elder, near Aberdeen.

(*Fuckelia Plowrightii* Niesel is *Dothidea tetraspora*, B. & Br. Plow., S.B., ii., 18.)

Sub-gen. 2. PHYLLACHORA. Nitschke.—Innate, growing on leaves, grasses, &c. Handbook, Nos. 2,426, 2,427, 2,428.

Dothidea Angelicæ. *Fr.*—Grevillea iii., 126. On Angelica.

Dothideæ epityphæ. *Cke.*—Black, shining, oblong, or irregular, rather tuberculate; asci clavate; sporidia narrowly elliptical, attenuated towards each end; binucleate, 0.12×0.04 mm. On flower stalks of *Typha*. Kings Lynn.

Gen. 4. ISOTHEA. Fr.—Handbk., p. 931. Species, Nos. 2,801 to 2,804.

Gen. 3. MELOGRAMMA. Tul.—Handbk., p. 801. Species, Nos. 2,405 to 2,409.

Melogramma rubricosum. *Tul.*—Grevillea iv., p. 25. On beech.

C. XYLARIÆI.

Gen. 1. XYLARIA. Fr.—Handbk., p. 789. Species, No. 2,372 to 2,378.

Xylaria Scotica. *Cke.*—Grevillea iv., p. 112. On the ground.

Dr. Nitschke has separated the small form of *Xylaria pedunculata*, which grows on rabbit's dung, from the larger form, under the name of *Xylaria Tulasnei*. The difference seems to be hardly specific. The small form is most common in Britain.

Gen. 2. **PORONIA**. *Fr.*—Handbk., p. 791. Species, No. 2,379.

Gen. 3. **THAMNOMYCES**. *Ehr.*—Handbk., p. 792. Species, No. 2,380.

Gen. 4. **USTULINA**. *Tul.*—Handbk., p. 793. Species, No. 2,381.

Gen. 5. **HYPOXYLON**. *Fr.*—Handbk., p. 793.

Sub-gen. 1. **DALDINIA**. *Not.*—Stroma superficial, subglobose, smooth, concentric within. Handbk., No. 2,384.

Sub-gen. 2 **PULVINATA**. *Fr.*—Stroma convex, somewhat hemispherical, papillate. Handbk., Nos. 2,385 to 2,390.

Hypoxylon majusculum. *Cke.*—Globose, often confluent, reddish brown, then black; perithecia ovate; stroma sooty black; ostiola at length prominent; sporidia elliptical, often curved, slightly narrowed at each end, dark brown. $\cdot 018 \times \cdot 007$ mm. *Hyp. multiforme* var.; *Cooke, F. Britt. i.*, 374.—On decayed wood and bark.

This is the *Hypoxylon fragiforme* var. *major*, of Berkeley, but the sporidia in that species are only $\cdot 01\text{--}012 \times \cdot 005\text{--}006$ mm., hence it is proposed as a distinct species.

Sub-gen. 3 **EPIXYLON**.—Stroma superficial, effused. Species, No. 2,391 to 2,394.

Hypoxylon miniatum. *Che.*

Effused, irregular, convex, tawny brown; perithecia connate, ovate, slightly papillate; stroma bright orange-red; sporidia broadly elliptical, flattened on one side, brown, $\cdot 01 \times \cdot 005\text{--}006$ mm.

On decorticated sticks.

It is difficult to refer this to any known species, the bright stroma being so very distinct.

Gen. 6. **NUMMULARIA**. *Tul.*—Handbk., Nos. 2,382, 2,383, 2,395.

Gen. 7. **EUTYPA**. *Tul.*—Handbk., p. 798. Species No. 2,396 to 2,404.

Eutypa aspera. *Fr.*—B. & Br. Ann. Nat. Hist., No. 1,726; *Grevillea vi.*, p. 128.

Gen. 8. **DIAPORTHE**. *Ntke.* (in part).

Stroma formed of the discoloured matrix; perithecia gregarious in definite spots, or broadly effused, often circumscribed by a black line; when covered, forming definite discoloured patches, rostellate, erect, not convergent, or united into a disc; sporidia hyaline, often narrowly fusiform and quadrinucleate.

This genus is not accepted in the sense usually adopted on the continent, that is, including within it all species, whether of *Diatrype* or *Valsa*, having quadrinucleate sporidia, but—having

regard first to the characters above indicated, irrespective of the sporidia—associating such species of which *Sphæria spiculosa* and *Sphæria inquilina* may be regarded as the type.

Section I. CORTICOLÆ.

Diaporthe pulla. *Nke.*—Handbk., No. 2,647. On ivy.

Diaporthe inæqualis. *Curr.*—Handbk., No. 2,440. Under *Diatrype*.

Diaporthe Badhami. *Curr.*—Handbk., No. 2,446. Under *Diatrype*.

Diaporthe nucleata. *Curr.*—Handbk., No. 2,445. Under *Diatrype*.

Diaporthe Laschii. *Nke.*—Grevillea iii., p. 68. On *Euonymus*.

Diaporthe protracta. *Nke.*—Grevillea vi., p. 26. On *Acer campestre*.

Diaporthe sarothamni. *Nke.*—Grevillea vi., p. 26. On broom.

Diaporthe Wibbii. *Nke.*—Grevillea vi., p. 26. On *Myrica*. Probably hardly a good *Diaporthe*, as limited by us.

Diaporthe putator. *Nke.*—Grevillea vi., p. 26. On poplar. Often very much like a *Valsa*, probably its true condition.

Diaporthe Ryckholtii. *Nke.*—Grevillea vi., p. 26. On *Symphoricarpos*.

Diaporthe scobina. *Nke.*—Grevillea iii., p. 67. On ash.

Diaporthe spina. *Fekl.*—Grevillea iii., p. 126. On *Salix*.

Diaporthe ilicina. *Cke.*—Fungi Britt. ii., 490. On holly.

Diaporthe aucubæ. *Sacc. in Michelis.*

Forming elliptical or irregular cinereous spots, covered by the discoloured cuticle, which is pierced by the ostiola. Stroma blackened; perithecia semi-immersed; sporidia narrowly fusiform, quadrinucleate.

On *Aucuba japonica*. Forden, Rev. J. E. Vize.

Diaporthe occulta. *Nke.*—Grevillea iii., p. 68. On scales of fir cones.

Diaporthe samaricola. *Ph. & Ph.*—Grevillea iii., p. 126. On ash keys.

Diaporthe Phillyreæ. *Cke.*

Forming definite elliptical or irregular discoloured spots; perithecia scattered; ostiola slender, piercing the cuticle; asci clavate; sporidia 4 nucleate then uniseptate.

On twigs of *Phillyrea*.

Section II. HERBICOLÆ.

Diaporthe inquilina. *Fr.*—Handbk., No. 2,648. On *Umbellifera*.

Diaporthe lirella. *M. & N.*—Handbk., No. 2,685. On *Spiræa*.

Diaporthe acus. *Blox.*—Handbk., No. 2,686. On dock.

Diaporthe pantherina. Berk.—Handbk., No. 2,689. On *Pteris*.

Diaporthe pardalota. Mont.—Handbk., No. 2,690. On *Convallaria*.

Diaporthe Epilobii. Fekl.—Grevillea v., p. 63. On *Epilobium*.

Diaporthe Vincæ. Cke.—Grevillea v., p. 63. On *Vinca*.

Diaporthe Euphorbiæ. Cke.—Grevillea iii., p. 67. On *Euphorbium*.

Diaporthe Labiata. Cke.—Grevillea v., p. 63. On *Prunella*.

Diaporthe orthoceras. Fr.—Grevillea v., p. 64. On ragwort.

Diaporthe obsoleta. Sacc.—Grevillea vi., p. 26. On *Hypericum calycinum*.

Diaporthe arctii. Lasch.—Grevillea vi., p. 26. On burdock.

Diaporthe dulcamaræ. Nle.—Grevillea vi., p. 26. On bitter-sweet (*Solanum dulcamara*).

D. VALSEI.

Gen. I. DIATRYPE. Fr.—Hdbk., p. 809.

Sub-Gen. I. DIATRYPELLA. Not.—Asci polysporous. Species, Handbk., Nos. 2,429 to 2,433.

Diatrype Tocciana. Not.—Grevillea i., p. 155. On *Alnus*.

Sub-Gen. II. STICTOSPHÆRIA. Tul.—Asci octosporous, effused broadly. Species, Handbk., No. 2,434.

Sub-Gen. III. DISCOSPHERIA. C.—Pustules discoid. Species, Handbk., Nos. 2,435, 2,436.

Sub-Gen. IV. GENUINA. Pustulate. Species, Handbk. Nos. 2,437 to 2,444 and 2,447 to 2,453.

Diatrype ceramblycola. B. & Br.—Ann. Nat. Hist., No. 1,725; Grevillea.

The *Myrmæcium* of continental botanists is *Diatrype*, with unispore spores, and only an artificial genus.

Gen. 2. MELANCONIS. Tul.—Handbk., p. 818. Species, No. 2,454 to 2,459.

Melanconis modonia. Tul.—Grevillea iii., p. 67. On *Castanea vesca*.

Gen. 3. VALSA. Fr.

Without attempting to disturb the arrangement adopted in the "Handbook" for this genus—at least for the present—we would suggest the grouping of the series *Valsella*, p. 821, into three sub-sections, viz.:—

I. ASTROSTOMA. Ostiola sulcate. Species, Nos. 2,478, 2,461, 2,460.

Valsa microspora. Cke. & Plow.

Disc erumpent, orbicular, furfuraceous, brown, pierced by the circinating sulcate ostiola. Perithecia 12-20; asci subclavate,

·03-·04 mm. long; sporidia very minute, hyaline, sausage-shaped about ·005 mm. long.

On branches of Beech (C. B. P.)

The asci and sporidia are the smallest in any British *Valsa*.

II. *LEUCOSTOMA*. Ostiola even, disc white. Species, 2,463, 2,464, 2,465, 2,476.

III. *LEIOSTOMA*. Ostiola even, disc coloured or obsolete. Species, 2,460 to 2,483, except as above.

***Valsa Curreyi*. Nke.**

Sporidia ·012-·016 × ·003 mm., or twice as large as those of *Valsa Abietis*, Fr.

On fir branches. Perth, N.B.

***Valsa ceuthospori*. Cke.**—Grevillea iv., 113, as *Valsa Lauro-cerasi*, Tul., but the sporidia differ from the species described by Tulasne. See Fungi Britt. ii., 468.

***Valsa cypri*. Tul.**—Grevillea i., 155. On privet twigs.

***Valsa abrupta*. Cke.**

Pustules orbicular, flattened. Perithecia immersed in a brownish pulverulent stroma, necks short. The cuticle being deficient around the pustules leaves a distinct brown ring formed by the inner bark round the disc; asci clavate; sporidia sausage-shaped, about ·012 mm. long.

On twigs of *Salix caprea*. Shere.

***Valsa cornicola*. Cke.**

Disc erumpent, orbicular, brown; perithecia small, black, with converging necks; ostiola forming a more or less regular ring; asci clavate; sporidia sausage-shaped, ·012 mm. long.

On twigs of *Cornus*. Darenth.

Quite distinct from *Valsa fallax*, Nke.

***Valsa resecans*. Nke.** (*Valsa Syringæ*, Fungi Britt. i., 492).—Grevillea iv., p. 124.

On *Syringa vulgaris*.

***Valsa Fuckelii*. Nke.**

Perithecia 10-20, small, crowded, with small black shining ostiola, which are closely collected into an erumpent disc; asci clavate; sporidia sausage-shaped, hyaline, ·009-·012 × ·0025 mm.

On *Corylus avellana*. Shere.

Genus 4. **CUCURBITARIA**. Gray.—Handbk., p. 840. Species, Handbk., Nos. 2,516 to 2,524.

***Cucurbitaria rhamnii*. Fckl.**—Grevillea vi., p. 26. On branches of *Rhamnus*.

***Cucurbitaria euonymi*. Cke.**—Grevillea iii., p. 67. On *Euonymus*.

***Cucurbitaria dulcamaræ*. Fr.**—Grevillea ii., p. 188. On *Solanum dulcamara*.

***Cucurbitaria syringæ* (*Othia syringæ*. Niessl).**—Hedwigia, 1876, p. 2. On lilac twigs.

Genus 5. GIBBERA. Fr.—Handbk., pp. 843. Species, Handbk., Nos. 2,525 to 2,526, 2,344.

Gibbera flacca. Wallr.—Grevillea vi., p. 25. On *Solanum dulcamara*.

E. SPHÆRIÆI.

Genus 1. MASSARIA. Not.—Handbk., p. 844. Species, Nos. 2,527 to 2,535.

Massaria rhodostoma. Tul.—Grevillea vi., p. 26. On *Rhamnus frangula*.

Genus 2. LOPHIOSTOMA. Not.—Handbk., p. 848. Species, 2,537 to 2,548.

Lophiostoma hederæ. Fckl.—Grevillea iii., 27. On ivy.

Genus 3. CERATOSTOMA. Fr. (p p.).

Perithecia superficial, or semi-immersed, scattered or gregarious; ostiolum elongated, cylindrical, free, longer than the perithecium, emergent. Species, Handbk., Nos. 2,625 to 2,630.

Ceratostoma crinigera. Cke.—Grevillea i., p. 156. On pine wood.

Genus 4. BYSSOSPHERIA. Cke.

Perithecia superficial, free, seated on a tomentose subiculum of interwoven threads, at first veiled. (*Sphæria*, *Byssisedæ*, Fr. S. M. ii., 440.) Species, Handbk., 2,549 to 2,552, 2,556.

Although this includes the greater part of the genus *Rossellinia* of De Notaris, it corresponds to none of the numerous genera recently proposed, because it is not restricted on account of the form of the sporidia.

Byssosphæria Keitii. B. & Br. — Ann. N. H., No. 1626. On a piece of cord.

Genus 5. PSILOSPHERIA.

Perithecia superficial, gregarious or crowded, naked, black, carbonaceous, often corrugated or tuberculate; ostiolum scarcely prominent. (*Sphæria*, *Denudatæ*, Fr. S. M. ii., 452.)

Species, Handbk., 2,575 to 2,577, 2,580 to 2,582, 2,586, 2,587, 2,589, 2,590, 2,597, 2,598, 2,600, 2,601, 2,612 to 2,617, 2,619, 2,620.

Psilosphæria parmeliarum. Ph. & Pl.—Grevillea iv., p. 124. On *Parmelia saxatilis*.

Psilosphæria ostioloidea. Cke.—Grevillea iv., p. 113. On *Diatrype quercina*.

Psilosphæria caninæ. Ph. & Pl.—Grevillea vi., p. 27. On *Peltigera canina*.

Psilosphæria Stevensonii. B. & Br.—Ann. N. H., No. 1,728. On dead wood.

Psilosphæria carbonaria. *Ph. & Pl.*—Grevillea ii., p. 188. On burnt ground.

Psilosphæria lichenicola. *Not.*—Grevillea i., p. 156. On *Solorina crocea*.

Psilosphæria cetrariicola. *Nyl.*—Grevillea iii., p. 68. On *Cetraria Islandica*.

Genus 6. LASIOSPHÆRIA. Not. (in part).

Perithecia superficial, more or less villous, hairy, or strigose, sometimes seated amongst Dematioid threads. (*Sphæria, Villosæ*, Fries.)

Species, Handbk., Nos. 2,553 to 2,555, 2,557 to 2,561, 2,563 to 2,574, 2,578, 2,584, 2,585, 2,592.

Lasiosphæria felina. *Fekl.*—Ann. N. H., No. 1,332. On *Rubus*.

Lasiosphæria cupulifera. *B. & Br.*—Ann. N. H., No. 1,333. On rotten elm roots.

Lasiosphæria helioma. *Ph. & Pl.*—Grevillea vi., 26. On ground and sawdust.

Lasiosphæria membranacea. *B. & Br.*—Ann. N. H., No. 1,493. On rotten wood.

Genus 7. SORDARIA. Not.

Perithecia crowded or scattered, coriaceo-membranaceous, semi-immersed, attenuated above or papillate, covered at first with an evanescent tomentum, or hairy above, sometimes nestling in a pseudostroma.

Species, Handbk., 2,536, 2,562, 2,594 to 2,596, 2,622.

Sordaria merdaria. *Fr.*—Grevillea iv., p. 123. On horse dung.

Sordaria equorum. *Fr.*—Grevillea iv., p. 124. On horse dung.

Sordaria fimiseda. *Ces. & Not.*—Grevillea vi., p. 28. On horse dung.

Sordaria minuta. *Winter.*—Grevillea vi., p. 28. On rabbit's dung.

Sordaria platyspora. *Ph. & Pl.*—Grevillea vi., p. 28.—On horse dung.

Sordaria microspora. *Ph. & Pl.*—Grevillea vi., p. 28. On horse dung.

Sordaria discospora. *And.*—Grevillea ii., p. 187. On rabbit's dung.

Sordaria curvula. *And.*—Grevillea ii., p. 187. On dung of cows, &c.

Sub-genus. DELITSCHIA. Spores septate.

Sordaria Winteri. *Ph. & Pl.*—Grevillea ii., p. 188. On rabbit's dung.

Sordaria bisporula. *Hans.*—Grevillea vi., p. 28. On horse and rabbit's dung.

Sordaria minutella. *Fckl.* (sub. *Delitschia minuta*).—Grevillea vi., p. 29. On goat's dung.

Genus 8. **SPORORMIA.** *Not.*

Perithecia minute, membranaceous, immersed in dung. Sporidia breaking up into joints.

Sporormia intermedia. *Awd.*—(*Sphæria sporormia*, Handbk., No. 2,593.) On dung.

Sporormia megalospora. *Awd.*—Grevillea vi., p. 29. On horse dung.

Sporormia octomera. *Awd.*—Grevillea vi., p. 29. On grouse dung.

Sporormia lignicola. *Awd.*—Grevillea vi., p. 29. On rotten ash.

Sporormia Notaxisii. *Ces.*—Grevillea iv., p. 113. On grouse dung.

Genus 9. **CONISPHERIA.** *Cke.*

Perithecia smooth, naked, conical, flattened at the base, or semi-immersed, pierced at the apex. (*Sphæria*, *Pertusæ*, Fries, in part.)

Species, Handbk., Nos. 2,604 to 2,611.

Conisphæria pædida. *B. & Br.*—Ann. N. Hist., No. 1,396. On beech.

Genus 10. **XYLOSPHERIA.** *Cke.*

Perithecia innate, immersed in the naked wood, with a short narrow erumpent ostiolum. (*Sphæria*, *Immersæ*, Fries.)

Species, Handbk., No. 2,631 to 2,637.

Xylosphæria parallela. *Fr.*—Grevillea i., 174. On pine wood.

Xylosphæria nigrofacta. *Cke.*—Grevillea ii., p. 164. On old cabbage stems.

Xylosphæria surrecta. *Cke.*—Grevillea v., p. 119. On pine rails.

Genus 11. **SPHERIA.** *Fr.* (p.p.)

Perithecia scattered or gregarious, at first covered, piercing the cuticle with the erumpent neck rarely concealed. (*Obtectæ*, Fr. S. V. S.)

a *CORTICOLÆ*—

Species, Handbk., Nos. 2,639 to 2,646, 2,649 to 2,660, 2,662 to 2,684, 2,687, 2,688, 2,691, 2,694 to 2,724, 2,726 to 2,734.

Sphæria rhodobapha. *B. & Br.*—Ann. N. Hist., No. 1,334. On decorticated branches.

Sphæria mamillana. *Fr.*—Grevillea i., p. 175. On oak twigs.

Sphæria applanata. *Niessl.*—Grevillea iii., p. 126. On raspberry canes.

Sphæria acerina. *Rehm.*—Grevillea vi., p. 27. On *Acer campestre*.

b CAULICOLÆ—

Species, Handbk., Nos. 2,694 to 2,734.

Sphæria devexa. *Desm.*—Grevillea vi., p. 27. On *Polygonum persicaria*.

Sphæria bryoniæ. *Fekl.*—Grevillea iii., p. 68. On *Bryonia dioica*.

Sphæria aparine. *Fekl.*—Grevillea vi., p. 27. On *Galium aparine*.

Sphæria heleocharis. *Karst.*—Grevillea vi., p. 27. On *Eleocharis*.

(**Sphæria maculans.** *Desm.*—Ann. N. Hist., No. 1,727 = *Sphæria Alliariæ*, *Awd.*)

Sphæria refracta. *Cke.*—Grevillea v., p. 119. On *Scirpus*.

Sphæria Michotii. *West.*—Grevillea v., p. 119. On *Juncus*.

Sphæria epicarecta. *Cke.*—Grevillea v., p. 120. On leaves of *Carex*.

Sphæria marxam. *Cke.*—Grevillea v., p. 120. On *Ammophila*.

Sphæria maritima. *C. & Plow.*—Grevillea v., p. 120. On *Juncus maritimus*.

Sphæria pontiformis. *Fekl.*—Grevillea v., p. 120. On straw.

Sphæria nardi. *Fr.*—Grevillea v., p. 120. On *Nardus strictus*.

Sphæria norfolcia. *Cke.*—Grevillea v., p. 120. On *Juncus* and *Eleocharis*.

Sub-genus. PLEOSPORA.

An artificial section founded on the sporidia, which are large, coloured, and septate, usually with transverse divisions.

Species, Handbk., Nos. 2,650, 2,692, 2,693.

Sph. (Pleospora) culmorum. *Cke.*—Grevillea iii., p. 68. On straw and grass.

Sphæria rubicunda. *Niessl.*—Grevillea vi., 27. On *Juncus*.

Sphæria vulgaris. *Niessl.*—Grevillea vi., p. 27. On *Senecia Jacobæa*.

Sphæria donacina. *Fr.*—Grevillea vi., p. 27. On *Arundo donax*.

Sphæria rubelloides. *Plow.*—Grevillea v., p. 120. On *Triticum repens*.

Sphæria clara. *Awd.*—Grevillea v., p. 121. On *Sparganium*.

Sphæria typhæcola. *Cke.*—Grevillea v., p. 121. On *Typha angustifolia*.

Sphæria subriparia. *Cke.*—Grevillea v., p. 121. On *Carex riparia*.

Genus 12. SPHÆRELLA. Not.—Handbk., p. 912.

Species, Handbk., No. 2,742 to 2,777.

Sphærella Euphorbiæ. *Ph. & Pl.*—Grevillea vi., p. 28. On *Euphorbia amygdaloides*.

Sphærella Taxi. *Cke.*—Grevillea vi., p. 128. On leaves of *Taxus*.

Sphærella Iridis. *Gonn. & Rab.*—Grevillea ii., p. 188. On leaves of *Iris pseudacorus*.

Sphærella ditricha. *Fr.*—Grevillea iii., p. 68. On leaves of birch.

Sphærella hederæcola. *Fr.*—Grevillea iii., p. 69. On living ivy leaves.

Sphærella atomus. *Desm.*—Grevillea iii., p. 69. On dead beech leaves.

Sphærella juncina. *Awd.*—Grevillea v., p. 121. On *Juncus*.

Sphærella scirpi-lacustris. *Awd.*—Grevillea v., p. 121. On *Scirpus lacustris*.

Sphærella chlouna. *Cke.*—Grevillea v., p. 121. On *Phalaris arundinacea*.

Sphærella perpusilla. *Desm.*—Grevillea v., p. 122. On leaves of grass.

Sphærella brachytheca. *Cke.*

Spots orbicular, whitish, surrounded by a dark line; perithecia punctiform, collected towards the centre of the spots; asci clavate or ovate; sporidia subfusiform, straight or curved, uniseptate, hyaline, $\cdot 014\text{--}\cdot 015 \times \cdot 003$ mm.

On the upper surface of living leaves of *Vaccinium Vitis Idæa*. Forres (Rev. J. Keith).

Similar to *Sphærella Gaultheriæ*, *Cke.*, which is a North American species, with larger sporidia.

Sphærella peregrina. *Cke.*

Scattered over the stems and leaves, sometimes densely gregarious; perithecia punctiform, papillate; asci broadly clavate; sporidia crowded, shortly fusiform, uniseptate, hyaline, $\cdot 015\text{--}\cdot 018 \times \cdot 004$ mm.

On dead stems and leaves of *Rubia peregrina*. Symond's Yat, near Ross.

Genus 13. GNOMONIA. Not.

Species, Handbk., Nos. 2,735 to 2,741.

Gnomonia graphis. *Fekl.*—Grevillea v., p. 64. On leaves of *Rubus fruticosus*.

Gnomonia pinophylla. *Ph. & Pl. (Diaporthe).*—Grevillea iv., p. 124. On pine leaves.

Genus 14. VENTURIA. Not.—Handbk., p. 922.

Species, Handbk., Nos. 2,778 to 2,784.

Venturia atramentaria. *Cke.*—Grevillea i., p. 175. On leaves of *Vaccinium uliginosum*.

Venturia glomerata. Cke.—Grevillea iii., p. 69. On leaves of *Geranium dissectum*.

Venturia alchemillæ. B. & Br.—Ann. Nat. Hist., No. 1,493*. On leaves of *Alchemilla*.

Genus 15. **PYRENOPHORA.** Fr.—Handbk., p. 925.

Species, Handbk., No. 2,785.

Pyrenophora trichostoma. Fr.—Grevillea v., p. 122. On rotting straw.

[*Cephalotheca sulphurea*, Eckl., belongs to the Perisporiacei.]

RECENT EXPERIMENTS BY DR. MINKS.

“LICHENS NOT PARASITICAL FUNGI ON ALGÆ.”

I have demonstrated in my two publications, “Cryptogamic illustrée, Famille des Lichens,” 1868, and “Famille des Champignons,” 1870-72, p. 54), the impossibility of fusing together the two classes of lichens and fungi as they were understood by Linnæus and his contemporaries. Any one who has read my arguments, which are supported by numerous facts, will have been able to judge of the little value which can be placed on M. Schwendener's system, which declares that the gonidia of Lichens are Algæ enveloped in a parasitical fungus. I had insisted on a much more rational doctrine—that of M. Tulasne—which is explained in his excellent memoir, “Histoire organographique et physiologique des Lichens,” 1852, according to which the gonidia belong to the Lichens.

Cryptogamists have had before them, since the year 1868, the date of M. Schwendener's first memoir, two contrary systems. Each of these systems has been supported or combatted by learned observers. The conscientious and complete treatise published in 1877 by M. Th. Brisson, of Lenharrée, under the title of “Examen critique de la théorie de M. Schwendener,” will be read with great interest. It must be recorded here to his credit, that M. Th. Brisson is the only French botanist who has protested against this algolichenic theory, and who, while noticing that none of the supporters or opponents of M. Schwendener's ideas had brought forward M. Tulasne's doctrines, has expressed the very just opinion that the author of the organographic history of lichens is the clear-sighted physiologist who has approached most closely to what now seems to be the truth.

In the camp of the German experimentalist, Mons. de Bary, Max-Reess, E. Bornet, and Treub range themselves. In the opposite camp, that is to say, among those who combatted M. Schwendener's theories, although with reserve, figure Messrs.

Cohn, Caspary, and J. Muller, and we find nine authors who completely reject the theory. In the front rank of these we must place Mr. Crombie, then Messrs. de Krempelhuber, Th. Fries, W. Nylander, Franck, Caruel, Kærber, Archangeli and Weddel.

The learned world is at the present moment discussing two works on this algolichenic question, which are as yet but little known. The earlier in date is that of Dr. Sthal, "Culture complète jusqu'à la fructification;" although interpreted favourably to M. Schwendener's theory, this work is not devoid of interest, but it is impossible to avoid recognising by the very results of the culture, as reported by the author—notably *à propos* of a little *Pyrenocarp* (*Thelidium minutulum*)—that the algolichenic theory has had its day.

Dr. Sthal is in contradiction to M. Schwendener, since the latter asserts that the captive algæ are compelled to produce nourishment for themselves and their sovereign (fungo-lichen), while Dr. Sthal, on the other hand, has perceived that the hymenial gonidia take their nutriment from the constituent parts of the hymenium which surround them; and he even adds that the gonidia owe their greater dimensions to the influence of the Ascomycetes. Would not this contradiction suffice to cause the recognition of the falsity of the proposed system?

The observations based on the cultivation of the spores of *Thelidium minutulum*, with the spores of *Endocarpon pusillum*, are valueless.

If the author had cultivated the spores separately, he would have observed the same phenomena, but he thought this was unnecessary, since he began by that which he wished to prove—the singular genesis of the gonidia.

The labours of Dr. Minks are of very great importance, for they definitely decide the algolichenic question, while, at the same time profoundly modifying the anatomical notions which were entertained concerning the thallus of lichens. In his Memoir entitled, "Culture et vie des Lichens," this clever observer treated especially of the origin and development of the gonidia—an important point which is neglected by the schools of Messrs. Schwendener-Bornet. In his recent publication ("Flora," 1878), Dr. Minks not only confirms M. Tulasne's theory, establishing the fact that the gonidia decidedly have their origin in the hypha and cortical cells, but he proves from his experiments—experiments which have already been checked by other Cryptogamists, and principally by Dr. Müller, (Professor at the University of Geneva)—that the microgonidia, which are transformed into gonidia, exist in the hypha, rhizines, cortical cells, paraphyses, young thecæ, and even in the spores and spermatia—that is to say, in all the vegetative and reproductive cells. The transformation of the microgonidia into gonidia can easily be seen under the thin cortical layer, and in those parts of the bark which are contiguous to the medulla.

The Rev. J. Crombie, one of the most energetic, and also one

of the most clear-sighted opponents of the algo-lichenic theory, has noticed, and unsparingly criticised an assertion of Dr. de Seynes, which was not sufficiently well-founded, and which was developed during the session of the Clermont-Ferrand Congress (*Association Française pour l'avancement des sciences*, 1876, p. 495). "I permit myself to bring to notice," said Dr. de Seynes, "the analogy which exists between the tissue of the thick-sided cells of the lignicolous fungi and that of the filaments of certain lichens, which have appeared to certain authors, on account of their thickness, or their peculiar structure, to differ from the fungi cells, and to overthrow the algolichenic theory. The observations which I have just made appear to me to be of such a nature as not to permit the existence of this objection."

Dr. Leveillé first ("Traité de botanique," by Messrs. Decaisne and Le Maoût), and more recently M. Th. Brisson ("Exam. crit. de la théorie de Schwendener," p. 35 and 36), and Dr. W. Nylander, have pointed out the difference of structure in question. This structure exists not only in certain lichens but in all. Dr. Leveillé has shown the difference which exists between the germinative filaments of lichens and the fungi mycelium. Why does Dr. de Seynes compare other tissues about which there is no question? Has he established the slightest resemblance of structure between the exceptional fungi cells and the ordinary filaments of lichens?

Dr. W. Nylander ("Flora," 1877, No. 23, p. 256), refutes M. Tulasne's observation ("Mémoire Lich.," p. 20), in which it is stated that the cells (gonidia) *sprung directly from the filaments of the medulla*. The author of the "Synopsis Lichenum" declares that in no case do the filaments themselves give birth to gonidia. "The latter," says he, "have their origin in the parenchymatous cortical cells, which are observed on the prothallian filaments of germination."

This is a contradiction of the new discoveries of Dr. Minks, and of other naturalists who have confirmed the facts advanced by him. Thus, the microgonidia which are transformed into gonidia, would seem to exist, not only in the hypha, but in all the cells of vegetation and reproduction of lichens.

I will sum up in a few words some other observations which, from other points of view, are calculated to define the very clear separation between the two neighbouring families, and which observations Dr. Minks's discovery decide to be well founded.

Thecasporous fungi may be developed everywhere, in damp or dark places; lichens, on the other hand, love plenty of light.

Fungi are always provided with hyphæ, while these are wanting in certain species of lichens.

The anatomical elements of the filaments of lichens may be distinguished by numerous characteristics from the hyphæ of fungi. They are firmer, more elastic, and may be at once recognised in the texture of lichens, and by the lichenin which may already be seen in the first germ-filaments. On the other hand, the hyphæ of

fungi are very soft, with thin sides, not at all gelatinous, and dissolve immediately under the action of potash.

The thallus of lichens is never viscous, while this is a very common property of the large species of fungi.

The fructiferous receptacle of fungi generally differs from that of lichens, especially in the *Pezizæ*; its surface (epithecium) is bare in fungi; the extremity of the paraphyses, which is often prominent and colours the disc, passes rapidly and disappears in the fungus. In lichens, on the other hand, the epithecium is constant; it is formed not only by the swelling of the prominent extremity of the paraphyses, but often also by a granular and persistent matter. Moreover, the receptacle of fungi has only a limited duration; even in the *Sphæriæ*, which lasts a long time, although not perennial, the receptacles do not last more than a year at the outside. Once the *Sphæriæ* have developed and fructified, they have accomplished their existence; we do not see them vegetate anew. The suberous Polypores seem to extend their life to 14 or 15 years, still they really renew themselves every year, for the new fungus is developed on the old one, which serves it as a support, and, indeed, in some measure, as nourishment. Lichens, on the other hand, have a slow and intermittent growth. Their receptacle is perennial, and may last for several years, and always be in a state of nascent fructification.—C. ROUMEGUÈRE. (*Translated from* "Revue Mycologique," No. 1, 1879).

DISEASES OF PLANTS CAUSED BY *PERONOSPORÆ*, MODE OF TREATMENT, &c.

By Dr. MAXIME CORNU.*

The *Peronosporæ* are the cause of a series of diseases which infest, or may infest, our crops. In order to prevent their ravages, one must consider first the nature and life-history of these parasites, secondly, that of the plant attacked, and the cultivation it requires. The subject is a difficult one, and requires extreme attention.

P. gangliiformis will often be taken as an example, but most of the conclusions drawn from this are general, and applicable to other species, with some slight modifications.

A. *In order to prevent either the extension or the local production of the parasite.*

1°. *The period of the existence of the parasite should be noticed.* Some occur early (*P. Cyparissiae*, *P. Viciæ*). In this case endeavour should be made to retard the crops until their disappearance. Others occur late (*P. infestans*). In this case the crops should be got in before their appearance. This last method may be adopted for potatoes, but not for tomatoes in our climate.

* Translated from "Comptes Rendus," December, 1878, by T. Howse.

These observations cannot be applied to *P. gangliiformis*.

2°. When the entire plant is attacked by the disease, it should be got rid of at once; it is a hotbed of infection; it is generally more elongated, paler, and more weakly than others.

3°. The infected leaves should be removed, so that the plant may not contaminate itself or other plants; this should be done with precaution, in dry weather, when there is neither wind nor dew.

4°. Destroy without exception, as far as possible, all the seeds which may harbour the parasite; in the case of *P. gangliiformis*, take away the composite plants, such as *Circium arvense*; it is necessary to watch attentively chicory, artichokes, &c.; consider them as a hotbed of infection, and, if necessary, give up their cultivation.

5°. All plants, or portions of plants, whether green or withered, infected by the *Peronospora* or its mycelium, should be removed; the green portions left on the ground may, in damp weather, produce fresh spores; the withered portions may contain resting spores, and so become a source of danger.

6°. They should be plunged at once into a solution which destroys the parasite (chlorate of lime, sulphate of potassium, etc.); otherwise the *Peronospora* may be spread.

7°. They should be entirely destroyed, either burnt or deeply buried. In no case should they be used as manure or as food for domestic animals, as is often done; the resting spores (oospores) do not lose their vitality or their hurtful properties.

By following these instructions, which are general, and are easily applied to a large number of vegetable parasites, it will be possible both to neutralize the centres of infection and to prevent them spreading. The more valuable the crop, the more care should be given to their application.

B. Mode of protecting the plant from the spores, and killing the parts attacked.

In this case the peculiarities of the plant have to be considered. We will take the lettuces as an example; many facts, however, applicable to them are general, and not restricted to them.

It is known that this problem has reference to early crops only; these are produced under the following special conditions:—

The plant is—1°, annual, and comes from seed; 2°, it is pricked out; 3°, it is cultivated under frames during winter and spring; 4°, it is planted in rich earth; 5°, the crop is of short duration.

1°. In sowing the seeds, rubbish should be removed, which might contain resting spores; the seeds should be carefully picked, or, better still, taken from healthy plants.

2°. Pricking out. Healthy seedlings only should be used. Leaves bearing the parasite generally perish later on, as I have seen in a great number of crops attacked by various parasites (*Uredo*, *Æcidium*, *Puccinia*, *Stigmatea*, *Dothidea*, *Cystopus*, *Peronospora*, and among them, *P. gangliiformis*. This does not apply entirely to

plants provided with bulbs, rhizomes, or transplanted with a large quantity of earth.

3°. *Exposed to frost, the leaves attacked by the parasite are the first killed.* This advantageous result is known to market gardeners. It is necessary, both in this and the preceding case, to remove the withered leaves. It is probable that any weakening cause produces the same effect; the decay, through damp of plants prepared for sale, is thus explained. Hence the use of solutions of sulphate alcalines, or solutions saturated with nourishing principles is to be recommended; these would for the time slightly weaken the plant. *It is dangerous to open the frames; wind, which propagates the spores, should be avoided.*

Any infected or suspected frames should be opened *separately*. The frames should not all be placed all in order, that a general infection may be avoided.

4°. *Every year the situation of the crops should be changed; fresh earth should be always used.*

The soil only should be watered; the leaves should never be wetted, to avoid the attachment and germination of spores.

5°. When the plant is in the young state it should be carefully protected, so that it may have the start of the parasite, which, later on, is less to be feared, owing to the imbrication of the leaves.

The evil will be much lessened by following these recommendations. Independently of these precautions, is it possible to prevent the putrefaction of lettuce leaves attacked by *Peronospora*? These leaves die through exhaustion; to oppose this, one may endeavour—

a. By keeping the plants gathered at a very low temperature until they are required, so that the parasite may be destroyed.

b. By gathering the lettuces with their roots, so as to prevent the exhaustion of any leaves already infected.

Practical men must judge which of these two methods is the best. Further details and explanations on this subject will be given in a more extended publication.

SOME EXOTIC FUNGI.

By M. C. COOKE.

The following few species have been received from various correspondents, as indicated in each instance.

Melanogaster durissimus. *Cke.*

Subglobosus, compressus, difformis aut sulcatus, lævis, durissimus, atro fuscus, demum nigrescens. Peridio crasso, subnitido; carne mire lacunoso, ochraceo albo; lacunis majusculis, creberrimis, atris. Sporis oblongo-ellipticis, inæqualibus, brunneis .005-.008 × .003-.005 mm. Odore fortissimo.

On the ground. Chakrâta, North of Delhi, India. (Baden Powell, Esq.)

They occur a few inches below the surface of the soil, only during the rainy season, at about 8,000 feet. They are occasionally

cooked and eaten, and the natives say that a little piece keeps off thirst in crossing high passes. This is always a point with the natives, who in other parts eat a fragment of a cake of the hill apricots, crushed together and dried for the purpose. All agree that these truffles are found singly, or one or two together, not attached to any root. Truffles are often spoken of in the hills of Kangra, and also in the Upper Chenāb Valley. The above notes are communicated by Mr. Baden Powell, with the specimens.

They are not a true truffle, but a *Gasteromycetous* fungus, which for a long time were confounded with truffles, but the spores are not produced within asci as in the genuine truffle. This does not accord with any of the species of *Melanogaster*, described by Tulasne, but probably is most nearly allied to *M. variegatus*. It is nevertheless larger, more irregular, of a different colour, very much harder, and the inner cavities are larger. When dry it has a strong odour when cut, in some respects resembling powdered rhubarb. The specimens were an inch and a half in diameter, and nearly an inch thick.

***Diplodia gossypina*. Cke.**

Gregaria, erumpens. Peritheciis sub-conicis, atris, subtus applanatis, fibrosis. Sporis ellipticis, olivaceo-brunneis $\cdot 022 \times \cdot 012$ mm.

On old capsules of *Gossypium*. Bombay (India). Washington, U.S.A. (*Mr. T. T aylor*.)

***Diplodia Andamensis*. Cke.**

Gregaria, erumpens. Peritheciis applanatis, nigris, supra depressis, pallido-cinctis. Sporis ellipticis, brunneis, nec constrictis $\cdot 028 - \cdot 03 \times \cdot 012$ mm.

On stems of creeping plant, called by the natives "Pilita Dak." Andaman Islands.

***Septoria Pipula*. Cke.**

Macula purpureo-brunnea, irregularis, amphigena. Peritheciis immersis, indistinctis, tenuis, epiphyllis. Sporis filiformibus, multinucleatis $\cdot 05 - \cdot 06$ mm. long.

On leaves of Peepul, or Pipula (*Ficus religiosa*). Belgaum, India. (Col. Julian Hobson.)

***Trichobasis exasperata*. Cke.**

Hypophyllis. Soris purpureo-brunneis, minimis, pulverulentis, hinc illic confluentibus, epidermide cinctis. Sporis ovato-globosis, supra papillato-asperulis, læte brunneis $\cdot 028 \times \cdot 02$ mm.

On leaves of unknown tree. Belgaum. (Col. Julian Hobson.)

***Sphærotheca pannosa*. Lev.**

On leaves of Roses. Belgaum, India. (Col. Julian Hobson.)

Colonel Hobson complains that the roses in India are suffering very much from this pest, as they suffer in Europe.

***Sphæropsis subglobosum*. Cke.**

Sparsum, lirellæforme. Peritheciis immersis, emergentibus, cuticulâ elongato-fissuratis. Sporis subglobosis, brunneis $\cdot 01 - \cdot 012$ mm. diam.

On culms of *Bambusa*. Demerara. (*R. McLachlan*.)

Dothidea chamæropsidis. *Cke.*

Atra, sub-hemisphærica, nitida, in maculis brunneis insidens. Cellulis paucis. Sporidiis amygdaloideis, brunneis $\cdot 02 \times \cdot 01$ mm.

On living leaves of *Chamærops*. Tangiers. (In Kew Herbarium.)

The specimens are very old, and the asci seem to have dissolved, but it is evidently an Ascomycetous fungus. The black shining pustules are not larger than half a grain of rape seed.

Coniothyrium Phormium. *Cke.*

Gregaria, minima, semi, immersa, elongato-fissurata. Sporidii hyalinis, ovalibus $\cdot 004 \times \cdot 003$ mm.

On leaves of *Phormium tenax*, in Botanic Gardens, Brussels; (in University Herbarium, Edinburgh).

Sphæria (Villosæ) subambigua. *Cke.*

Peritheciis gregariis, subglobosis, papillatis, atro-villosis. Ascis clavatis. Sporidiis cylindricis, hyalinis, nucleatis, dein uniseptatis, superne inflatis, demum dissilientibus, loculo inferno evanidis.

On sawdust, chips, &c. France. Communicated by T. Howse.

The ultimate form of the sporidia seems to be elliptical, truncate at one end, $\cdot 025 \times \cdot 01$ mm. At first they are cylindrical or fusiform, and $\cdot 05$ mm. long. The upper portion swells, becomes nucleate, a septum is formed in the centre, and ultimately the lower portion, or tail, falls away.

DESCRIPTION OF PLATE 101.

1. *Asterina clavuligera*, with conidium.
2. *Meliola Mitchellæ*, hyphæ and conidia.
3. *Pestalozzia brevipes*, spores.
4. *Vermicularia rectispora*, spores.
5. *Septoria Magnoliæ*, spores.
6. *Sporidesmium obelavatum*, spores.
7. *Uromyces tomentella*, spores.
8. *Cercospora Polygonorum*, hyphæ and spores.
9. *Cercospora sphæriæforme*, spores.
10. *Uromyces Desmodii*, spores.
11. *Cercospora Lupini*, hyphæ and spores.
12. *Fusisporium leguminum*, spores.
13. *Penicillium atrobrunneum*, tip of hypha and spores.
14. *Zygodesmus lævisporus*, portion of thread and spores.
15. *Ræstelia hyalina*, peridium enlarged.
16. *Ascomyces quercus*, asci and sporidia.
17. *Hysterium lineolatum*, perithecium and sporidia.
18. *Sphæria argyrostoma*, B. & C., asci and sporidia.
19. *Sphæria Ludwigia*, asci and sporidia.

By some error this was omitted at page 138 of vol. vi.

NEW BRITISH LICHENS.

Communicated by the REV. J. M. CROMBIE, F.L.S.

Dr. Nylander has recorded in the "Flora," 1873, pp. 241-246, the following *new species* of Lichens, which have been detected in N.W. Ireland by Mr. Larbalestier:—

1. **Pycnothelia apoda.** *Nyl.*—Thallus white or whitish, thin, thinly granuloso-crustaceous (K+ yellow), podetia few, abortive, small, erect, ellipsoideo-vesiculose or subgranuliform; apothecia sessile, often aggregated, rusty-red or red-ochraceous, opaque, plain, immarginate or somewhat convex; spores fusiformi-oblong, 0,007-0,010 mm. long, 0,004 mm. thick; paraphyses moderate; epithecium reddish-brown; thecae bluish and then yellowish and dark at the apices, with iodine.

On the ground. Kylemore, Galway. It has been gathered also in Central France.

As observed by Nylander, the spermatogones of this Lichen are very singular. They usually occur enclosed in the hymenium, without any distinct conceptacle, with spermatia slightly arcuate, 0,008-12 mm. long, 0,0005 mm. thick.

2. **Lecidea demarginata.** *Nyl.*—Apparently a subspecies of *Lecidea expansa*, *Nyl.*, with the thallus whitish or greyish, very thin, subleprose, and the apothecia convex.

On rocks. Kylemore, Galway. It has been gathered also in Finland.

3. **Lecidea rusticella.** *Nyl.*—Thallus whitish-ochraceous, thin, subleprose; apothecia black, opaque, convex, immarginate, dark within; spores 8 *nae*, suboblong, simple, 0,006-9 mm. long, 0,0025-35 mm. thick; paraphyses not discrete; epithecium and hypothecium brown or brownish; hymenial gelatine bluish, and then tawny wine-coloured or reddish wine-coloured, with iodine.

On rocks. Kylemore, Galway.

This differs from *L. rusticula*, *Nyl.*, in the different thallus and the smaller spores.

4. **Opegrapha xanthodes.** *Nyl.*—Thallus yellowish or greyish-yellow, thin, subsmooth, rimose; apothecia black, oblong; epithecium rimiform; spores 8 *nae*, fusiformi-oblong, 3-septate, 0,015-18 mm. long, 0,005-6 mm. thick; hypothecium (with the perithecium) blackish; hymenial gelatine tawny, reddish wine-coloured, with iodine.

On quartzose rocks. Kylemore, Galway.

The spermatia are straight, 0,004 mm. long, scarcely 0,001 mm. thick.

5. **Verrucaria subinumbata.** *Nyl.*—Thallus greyish, very thin or subevanescent; apothecia brownish in thalline verruculi; spores 0,022-30 mm. long, 0,015-18 mm. thick; otherwise as in *V. inumbata*, *Nyl.*, of which it may be a subspecies.

On mica-schist. Kylemore, Galway.

6. *Verrucaria elachistophora*. Nyl.—Thallus white, unequal, rimoso-diffract (perhaps not proper); apothecia (probably parasitic) black, slightly emersed, pyrenium entirely black, above somewhat impressed; spores 8 μ , colourless, oblongo-ellipsoid, simple (or sometimes spuriously 1-septate), 0,007-8 mm. long, nearly 0,0035 mm. thick; paraphyses moderate; hymenial gelatine not tinged with iodine.

On quartzose rocks. Kylemore, Galway.

A peculiar parasitical species, which may belong to the section of *V. epidermidis*.

I.—NOTE ON *Parmelia horrescens*, Tayl.

The plant so named by Taylor, in Mack. Fl. Hib. ii., p. 144, has hitherto remained unknown in consequence of no authentic specimens having been seen. It is no doubt true that Leighton, in his Lich. Fl., p. 138, identifies it with *Parmelia saxatilis* f. *furfuracea* (Schær.), but as he quoted no authority for this, he was evidently guided merely by Taylor's description. In a series, however, of Irish Lichens, in Herb. Brit. Mus., received from Taylor himself, a sterile specimen occurs of *P. horrescens* in his own handwriting. This shows it to be entirely referable to *Platysma diffusum* (Web.), with which his diagnosis sufficiently corresponds. Indeed, Taylor seems latterly to have become aware of this, for, beneath his own name, he writes = *Parmelia aleurites*, Ach., the true synonymy of which has elsewhere been pointed out by Nylander. There is also in Hb. Salwey, a specimen from N. Wales named by Taylor *P. horrescens*, which also = *Platysma diffusum*, though singularly enough Salwey refers to the same plant a specimen of *Parmelia saxatilis* f. *furfuracea*. Both the Irish and the Welsh plant are muscicole, and do not occur on bare rocks, as might be inferred from the habitat assigned by Taylor. J. M. C.

II.—NOTE ON THE SYNONYMY OF *Parmelia alpicola*, Fr. fil.

In some of the older British Herbaria in Herb. Brit. Mus., this plant occurs under different names, e.g., in hb. R. Brown s.n. *Lichen stygius*, and in hb. Sowerby s.n. *Lichen encaustus* (non Sm.). In more recent times also, when distinguished by authors as being either a distinct variety or species, it has had various trivial names given unto it. Dr. Lindsay, in "Trans. Roy. Soc. Edin," xxii. (1857), has termed it *Parmelia encausta* var. *stygioides*, in which he is followed by Mudd Man., p. 96. Nylander, in his "Synopsis," pt. II. (1860), has called it in pt. *Parmelia Mougeotii* f. *discreta*, and it appears in my "Enum.," p. 36, as *Parmelia discreta*, and in "Leight. Lich. Fl.," p. 127, as *Parmelia physodes* var. *discreta*. It is also, as proved by a specimen in hb. Carroll, *Parmelia stygia* f. *minor*, Nyl., in "Cromb. Enum.," p. 35. In Th. M. Fries' "Lich.

Arct." (1860), p. 57, where it is rightly separated alike from *P. stygia* and *P. encausta*, to both of which it is closely allied, it is named *Parmelia alpicola*, in which he is now generally followed by authors. There is, however, another trivial name older than any of the above. In recently looking over a portion of Salwey's Herbarium, now in the possession of the British Museum, I found a specimen of this plant marked *Parmelia encausta*; and on still more recently referring to "Schærer's Enum.," p. 42-3, I found this same specimen quoted as seen by him, and named *Parmelia ceratophylla* var. *atro-fusca*, as distinct from var. *multipuncta* (= *P. encausta*, Sm.). There is, therefore, no doubt that Schærer's name has priority, and that the plant should be called *Parmelia atro-fusca* (Schær.).

J. M. C.

TWO SPECIES OF PERONOSPORA.

By Prof. PASSERINI.

1. *Peronospora tribulina*.

Hypophylla, caespitibus densis, effusis, candidis; stipitibus erectis, apice parce ramosis, ramis primariis alternis subpatentibus breviusculis, ultimis subulato-arcuatis. Conidia subglobosa, hyalina.

Ad folia "*Tribuli terrestris*," L., *Parmæ* in R. Horto Botanico, Augusto, 1878.

2. *Peronospora Setariæ*.

Forma conidiophora.—Hypophylla, late effusa, candida, tandem sordidule cinerea; stipites crassi, primo simplices subclavati, dein superne parce ramosi, ramis primariis brevibus suboppositis, ascendentibus, apice incrassatis et palmatifido-ramulosi. Conidia subglobosa, hyalina.

In foliis junioribus jam explanatis, pallescentibus, *Setariæ verticillatæ*, P.B., prope *Parmam* (*Vigheffio*) æstate, 1878.

Forma oogoniophora (*Protomyces graminicola*, Sacc., M. V., n. 496, *Fungi Veneti novi vel critici* ser. v., n. 91. *Ustilago* (?) *Urbani*, Magnus, Sitzungsberichten der Botanischen Vereins der Provinz Brandenburg). Oosporæ globoso-angulosæ, episporio crasso, intense ochraceo-fulvo.

Ad folia juniora utplurimum convoluta et ferrugin ascentia *Setariæ verticillatæ*, P.B. *Parmæ* (*Vigheffio*), jam ab æstate anni 1876, reperta absque ullo *Peronosporæ* vestigio; et æstate nuper elapsa iterum observata, vel solitaria, vel in formæ conidiophoræ consantio, in eisdem plantis et foliis.

HEDWIGIA.—This journal has changed hands, and will have for its editor Dr. GEORGE WINTER.

THE MAPLE DISEASE (*RHYTISMA ACERINUM*).

By Dr. MAXIME CORNU.*

During the summer black spots produced by a parasitic fungus are frequently seen on Maple leaves. This is *Xyloma acerinum*, a special type of disease. *Xyloma* is but the imperfect and summer form of the fungus; when the leaves fall to the ground in autumn, a new growth appears in these spots; the plant produces asci and becomes *Rhytisma acerinum*.

These phenomena coincide with the germination of the young maples, which takes place early in April. These spots appear every year in the same locality. Is the parasite perennial, as in some Uredineæ (*Æcidium Euphorbiæ sylvaticæ*, and a large number of Pucciniæ)? Is it annual, as are *Ræsteliæ* and most *Æcidia*? Sown on one spot, does it spread over the whole plant, as *Endophyllum Sempervivi*, *Peronospora Papaveris*, etc.?

Very young seedlings of Maples were placed in several flower pots; two pots containing each eight plants, and others smaller containing each four, were used for the purpose.

The 1st April, 1874, some ripe patches of *Rhytisma* were cut up into narrow segments, like smoking tobacco, and moistened with water; small portions of the parasite were brought into contact with the young Maples. Every part of the seedling is not equally suitable for its introduction: *Ustilago Carbo* penetrates by the neck (collum), *Cystipus candidus* by the cotyledons. Direct research, anatomically, into the mode of introduction of the germs is rendered very difficult by the shape of the spores. These are much elongated, and their diameter and that of the germinating filaments exceedingly small; the germination is besides very irregular.

Four trials were made in order to ascertain the manner of penetration by the spores:—

(A.) A small portion of *Rhytisma*, as described above, was placed all round the collar, on a level with the earth.

(B.) A portion was placed within a cotyledon, which had been folded and kept in that position by a pin. Each of these two pots was covered with another pot, which had been moistened to prevent desiccation and the entrance of spores from the wind; the leaves did not produce *Rhytisma*, either in 1874 or in the following years.

(C.) A portion was placed between the two cotyledons, on the leaves of the undeveloped terminal bud.

(D.) A portion was placed between the leaves of the terminal bud after they had been raised by the stem; the cotyledons were covered with tallow to their base, in order to isolate them; they soon withered and fell off; the plants, although vigorous at first, became more weakly than the others.

* Translated from "Comptes Rendus," July, 1878, by T. Howse.

In the two last cases, *Rhytisma* appeared after two months and a half. The patches were at first white and greenish-grey, then turned partially, and at last entirely black; by the middle of July the patch was completely formed.

These plants were shown to M. Brongniart, M. Duchartre, M. Roze, and several other botanists. The leaves, which had all fallen, were gathered in the autumn. The parasite did not appear the next year, or subsequently; it must, therefore, be annual. It does not seem to spread. Of the plants experimented upon, merely the lower leaves, which were the only ones developed at the time of the experiment, were spotted; the spots were all in the same state; the mycelium did not spread.

In 1876 I endeavoured to trace on the leaves when they had attained their complete size, lines and crosses by means of the *Rhytisma*. The spots began to show, but the tissue dried up in all the leaves; the parasite was very incompletely developed, and did not re-appear the following year. So the fungus is altogether confined to the deciduous foliaceous organs; it is only fully developed on the organs when they are in a young state.

It appears, then, in order to destroy *Rhytisma*, that it is enough to remove all the spotted leaves which fall in autumn; that is, supposing that the corpuscles (*spermatia* of M. Tulasne), which are produced in enormous numbers on the living leaves (*Xyloma*), cannot reproduce the parasite.

The red spots on Plumtrees, produced by *Polystigma rubrum*, an ascomycetous fungus of quite another group, and much more dangerous, have probably an analogous life history.

CALIFORNIAN FUNGI.

By M. C. COOKE.

The following few remaining numbers of a collection made by Dr. Harkness are supplementary to our previous record:—

Hydnum Stevensoni. B. & Br.

On *Oreodaphne*. Sierra Nevada. No. 1073.
No. 1044, on oak, seems scarcely distinct.

Irpez paradoxus. Fr.

On *Oreodaphne*. Sierra Nevada. No. 1047.

Stereum muscigenum. B. & Br.

On Locust bark. Sierra Nevada. No. 1060.

Corticium. sp.

On decaying culms. No. 1042.

Not sufficient to determine; the white species are numerous, and closely allied, so that without the margin little certainty can be assured.

Glæosporium carpigenum. *Cke.*

Innatum, sparsum, cuticulâ tectum, demum perforatum. Sporis elongato-ellipticis, hyalinis, $.013-.018 \times .0035$ mm., in cirrhis albidis exudentibus.

On fruit of *Æsculus californica*. Sierra Nevada. No. 1066.

Colæosporium Madia. *Cke.*

Læte aurantium. Soris epiphyllis, ovatis, erumpentibus. Sporis concatenatis, aurantiacis, globoso-compressis, læve, $.023 \times .018$ mm.

On living leaves of *Madia Nuttallii*. Sierra Nevada.

Cytispora salicis. *Rabh.*

On willow twigs. Sierra Nevada. No. 1023.

Not a good *Cytispora*, probably better referred to *Phoma*.

To the above may be added the following species from New York:—

Stereum scriblitum. *B. & Cke.*

Coriacenm, pileo effuso reflexoque, rugoso-striato, obscure concentrico zonato, fuliginco-nigrescente; hymenio nudo, glabro, pallido subcinereo, demum rimoso.

On branches. New York, Gerard (171).

A very distinct species, externally nearly black and faintly zoned and striate; the hymenium pallid, with a cinereous tinge, soon cracked. Whole substance brittle when dry, curling inwards.

THE DUAL-LICHEN HYPOTHESIS.

"That hypothesis which is based on sound scientific knowledge is sure to have a corresponding value, and that which is a mere hasty random guess is likely to have but little value."—*Prof. Huxley, Lectures* (1863), p. 67.

Truth has often been discovered by the aid of a hypothesis, hence the proposition of a hypothesis for the advancement of science is perfectly legitimate. Some hypotheses which have been proposed in the past have proved utterly untenable when they have been assailed, therefore before any hypothesis is accepted it should be subjected to all possible tests. Any hypothesis which cannot suffer criticism is not worthy of acceptance. The dual-lichen hypothesis is worth very little if unable to meet all the objections which such an assailant as the present can urge against it.

Without contenting myself with reviewing the remarks of single individuals, I will rather go direct to the main source of the theory of which Schwendener is the author. In a few brief sentences the whole gist of the hypothesis may be summarized. Although at first only the group called the *Collema* were included, ultimately as his views extended, he included all Lichens in the category of Algo-fungi. These are his words, "As the result of my researches all these growths (Lichens) are not simple plants, not

individuals in the ordinary sense of the word, they are rather colonies, which consist of hundreds and thousands of individuals, of which, however, one alone plays the master whilst the rest in perpetual captivity prepare the nutriment for themselves and their master. This master is a fungus of the class *ascomycetes*, a parasite which is accustomed to live upon other's work, its slaves are green algæ, which it has sought out, or indeed caught hold of, and compelled into its service. It surrounds them, as a spider its prey, with a fibrous net of narrow meshes, which is gradually converted into an impenetrable covering, but whilst the spider sucks its prey and leaves it dead, the fungus incites the algæ found in its net to more rapid activity—nay, to more vigorous increase.”*

In the volume “Fungi” in the International Scientific series, from page 10 to page 16, the theory in question is explained in a manner which I believe perfectly fair and just, with the principal objections to be urged against it. This was printed in 1875, but is still as applicable as it was then. Perhaps it errs in partaking too much of the character of a summary, and too little of an argument. Had I not been challenged to give more distinctly the grounds of my opposition, that protest would have sufficed me. The hypothesis is thus briefly stated:—

“The two great points sought to be established are these, that what we call Lichens are compound organisms, not simple, independent vegetable entities; and that this compound organism consists of unicellular algæ, with a fungus parasitic upon them. The coloured gonidia which are found in the substance or thallus of lichens, are the supposed Algæ, and the cellular structure which surrounds, encloses, and imprisons the gonidia, is the parasitic fungus, which is parasitic on something infinitely smaller than itself, and which is entirely and absolutely isolated from all external influences.”†

In plain words, the gonidia are algæ, and all the rest of the plant is Fungus. At first sight it would appear that the whole controversy centered itself upon the definition of two words. A certain plant, with a peculiar organisation, has been hitherto by general consent represented by the term *Lichen*, whereas some modern writers contend that it should be called a *Fungus*, differing only from other Fungi in its power of enclosing certain unicellular algæ within its substance. Shall these organisms still retain the name of *Lichens*, or shall they be called *modified Fungi*? This is really one aspect which the hypothesis assumes, that of the value of two words. The theorists, on their part, maintain that it is something more than a mere definition of terms which is required, but they claim to have it accepted that *Lichens* (as they are called) are identical with *Fungi* (as commonly understood), but with the addition of certain extraneous bodies called “gonidia,” which are truly microscopic Algæ.

* Schwendener, “Die Algentypen der Flechtengonidien,” p. 3, 1869.

† “Fungi, their nature, use,” &c., pp. 11-12, 1875.

In the following observations the words "Lichens" and "Fungi" are used in the sense in which they are used and applied by Lichenologists and Mycologists. They represent two large groups of cryptogamic plants, holding close relationship to each other, but sufficiently distinct to be recognised by practical men, as amongst insects the Diptera are recognised from the Hymenoptera.

Whether we call them orders, or sub-orders, it matters not, we group them together for purposes of study into species, genera, families, &c.—mere arbitrary distinctions. Perhaps in nature there may be no such things, nothing more than *individuals*.

The lichenologist studies lichens, and groups them in a certain way, upon a definite plan, for the purposes of his study.

The mycologist does the same with Fungi. Each strives to comprehend his own particular group, and from the years of unceasing labour which many devote to the study they acquire a large amount of experience, which is their knowledge.

Whether a certain plant or series of plants—call them species or genera, or even families—belong to Fungi or Lichens these specialists have always been considered competent to judge for themselves, upon the principle that those who possess the largest amount of experience, and consequently of practical knowledge, upon these subjects, are best able to judge of their relationships and affinities. But, on the principle, I presume, that—

Some people must see their own farthing dip shine,
Though they stick it right under a gunpowder mine,

certain of those who may be termed "all round men," who study all things in general, and nothing in particular, have propounded a theory to account for certain phenomena which are puzzles to themselves, although not very mysterious to those in the habit of contemplating them.

Setting aside this preliminary assumption of superior knowledge on purely technical points, which the dualists assume, it must be conceded that if the hypothesis is proved sound, the specialists must accept it, from whatever source it originated, but if unsound, and incapable of standing the tests which may be applied to it by the Cryptogamists, not all the advocacy of the promoters, or the adherence of the most esteemed and talented men of science in other departments of Botany will compel the Cryptogamists to accept and apply a theory which is to them unsound and contrary to their experience and judgment.

Some general objections to the hypothesis will afford evidence that there is still a broad space between the theorists and some of their opponents.

Are Lichens Autonomous Plants? Is it, or is it not, possible from the structure or the development of a plant to predicate with tolerable certainty whether that plant is within itself a perfect or complete plant or not? If we sow a seed under favourable conditions, preserving it from all external influences, and that seed germinates, produces a root, a stem, ultimately leaves, the flowers,

with stamens and pistil, then in course of time, as the ovary matures, seed in all respects identical with that from which the plant originally developed; in such a case we should certainly conclude that the plant under examination is a complete and perfect plant, possessed of all the essentials for the reproduction of its species.

If instead of following the plant through all its stages, we bring experience to our aid in judging of probabilities, we examine a plant possessed of root, stem, leaves, and complete reproductive organs, bearing perfect seeds, we may safely conclude that we are examining a complete and perfect plant. All these organs we know by experience are not essential to the perfection of fruit in all plants, in some the stem will be almost obsolete, as in the daisy, or without true leaves, but with leaves and stem fused into a foliaceous expansion, as in the duckweed; and yet there will be no suspicion that the plant is incapable of reproducing its species, thus proving itself a perfect plant (using the term perfect, as in the sense of completeness). Hence we may conclude that if a plant is capable of reproducing its species, when excluded from all external influences, by means of its own proper organs, we may assume such an one to be a complete plant, whatever modifications in structure may be present, and whatever secondary organs may be absent. Such plants, however minute or simple in structure, are entitled to rank as autonomous plants.

The spore of a species of *Peziza* germinates, producing root-like fibrils of great delicacy, and upon these arise small globose bodies, which as they grow become perforated at the apex, ultimately expanding into a cup, which completes the vegetation of the little plant; it is simply a minute fleshy cup, with a fibrous base, by means of which it is attached to the matrix. A section of this cup exhibits the reproductive bodies, the ova (if such a term may be permitted) contained in elongated tubes, closed at the apex, and packed side by side. These spores when matured, are capable of reproducing the form and character of the parent. Yet simple as such a plant may be, no one has yet raised a doubt as to its being a complete plant.

Another simple plant, with similar cup-shaped organs, or receptacles, enclosing similar reproductive bodies, contained also in cylindrical tubes, but with other organs superadded, such as a foliaceous expansion, analogous to leaf and stem, or it may be some other bodies characteristic of the group to which it belongs; and at once analogy leads us to the conclusion that this also represents a complete plant.

If we concede that the Duckweed is a perfect plant, and the *Peziza* also a perfect plant, then also the *Lichen* must be a perfect plant.

Are Lichens (exclusive of their Gonidia) identical with Fungi?
The hypothesis in question assumes that the lichen consists of a fungus, enclosing certain foreign bodies, called gonidia. Hence

then lichens, irrespective of the gonidia, should correspond in all respects to the Fungi to which they are referred. The presence of these small organisms may be ignored in our comparison of the supposed fungus with the real fungus of our experience.

In comparing the general character of Lichens with the general character of Fungi, we may assume that we can arrive at some definite conclusion as to the probability of their identity. We can predicate nothing of fungi except what is confirmed by fact; and any other organisms to be affiliated to them must agree in all main features with the known characters of the Fungi, or they can have no claim to be considered identical.

It will facilitate this comparison if we are enabled to limit the area, which may be done by accepting the limitation fixed by the Schwendenerian hypothesis that the Ascomycetous Fungi are meant when the term Fungi is used, and as the *Sphæriacei* have been virtually excluded by all advocates of the theory, it may be assumed, as has been admitted, that the *Discomyces* are the special group of Fungi to which the Lichens are referred.

The *Discomyces*, in their cup-like forms are assumed to be identical with the apothecia of certain lichens, nay, more than this, all Lichens, to whatever genus they may belong, in their totality, excepting only their gonidia, are affirmed to be Discomycetous Fungi.

“Lichens are perennial; they grow very slowly, but they attain an extreme age. Some species growing on the primitive rocks of the highest mountain ranges in the world, are estimated to have attained an age of at least a thousand years; and one author mentions, after the lapse of nearly half a century, having observed the same specimen of *Sticta pulmonaria* on the same spot of the same tree.”*

On the other hand the Discomycetous Fungi are annual, very short-lived, their whole existence being limited to a few weeks, rapid in growth, and rapid in decay, not a trace of some species remaining after a few days.

Lichens will exist under conditions of aridity which no other vegetables could support. Some are peculiar to calcareous rocks, a few are found on arenaceous rocks, many are common on the granitoid series, including micaceous, gneissic, granitic and quartzose rocks, and *Lecidea geographica* is frequent on the purest and smoothest quartz.

Fungi, on the contrary, must have moisture for their very existence sake, are mostly found in damp and shaded situations, and could never exist under the conditions just enumerated for Lichens.

The highest mountains, beyond the snow-line, at 16,000 feet on Chimborazo, the extreme limits of vegetation at the North and South Pole are occupied by Lichens. Dr. Hooker found

* Dr. Lauder Lindsay, “Lichens,” p. 52.

three species of Discomycetes in the Falkland Islands, to 116 Lichens. The Reindeer Moss and species of *Umbilicaria* flourish amongst the snow. On the other hand, frost and snow are fatal to Discomycetous Fungi, which disappear long before the snow-line is reached on mountains, and even before phanerogamic vegetation in the direction of the Polar regions. Of all plants, Lichens support extreme cold most successfully, whilst Fungi succumb at the approach of frost.

Lichens which grow upon the bark of trees may be seen flourishing in profusion during the life and vigour of the tree. It has been affirmed that the portions of Cinchona Bark which have been covered with Lichens during growth, abound in the Alkaloids on which their medicinal use depends,* whereas the portions attacked by Fungi are valueless from the tissue being destroyed by the ramifying mycelium. Indeed, Fungi do not, and cannot flourish on growing and vigorous bark, but on diseased, dead or decaying spots.

Lichens obtain the greater portion of their pabulum from the atmosphere, and only their mineral constituents from the matrix. Hence they cover the trunks and branches of forest trees, without apparent injury, and many species habitually flourish on the hardest granite. Fungi, on the other hand, obtain their chief support from the decaying vegetable matter on which they flourish, gathering up a large store of the nitrogenous results of putrefaction and decay, and disintegrating the matrix on which they prey.

Lichens, in their chemical composition, contain a large number of substances which are wholly unknown amongst fungi. Colorific principles, such as obtain in the *Orchella* weeds, *Orcellic*, *Cetraric*, *Lecanoric*, *Tannic* and *Gallie* Acids, *Lichenin*, and even a peculiar and characteristic odour, all of which cannot be attributed to the gonidia they contain.

Lichens contain but a small percentage of water as compared with Fungi, so that in dessication they do not shrivel, collapse or perceptibly diminish in size, whereas Fungi shrivel up and collapse so as scarcely to be recognised, becoming liable constantly to the attack of insects, or, if damp, subject to the development of mould, whilst Lichens may be preserved for years under like conditions without fear of insect or mould.

Lichens, when collected and cast aside without the slightest care or precaution, do not exhibit the least tendency to putrefy, whilst Fungi, with the utmost care in drying, can scarce be preserved from unmistakable evidences of incipient putrefaction.

*Pharmacologists are aware that the most valuable kinds of Cinchona Bark, as, for instance the "Crown Bark," are habitually covered with Lichens, and that this covering favours the development of the Alkaloids. Regarding this fact, the late Mr McIvor, of Ootacamund, introduced the plan of covering the growing branches of *Chinchona* plants with moss, and the bark thus mossed produced a larger percentage of Alkaloids than the naked bark. The operation may be purely mechanical, such as obstructing the light. However this may be, certainly no injury is inflicted, but benefit is conferred by the growing lichens.

Any one who has examined the thallus of such a Lichen as *Peltigera canina*, and compared it with any known species of the Discomycetes, must come to the conclusion that amongst them there is no such structure to be found as that which prevails in the Lichen thallus, altogether irrespective of gonidia.

It is sometimes useful and instructive on doubtful points to consult the instincts of the lower animals, and this course may be adopted with advantage in the present instance. Amongst *Coleoptera*, there is an entire family called the *Mycetophagidæ*, many of which live upon Fungi, and yet do not attack Lichens. There are also some of the *Bostrichidæ*, and some species of *Anobium* very fond of Fungi, but they do not attack Lichens. The insects which destroy Lichens are few in number, and quite different in their relationships from those which prey on Fungi.

There is also amongst the *Diptera* a family called *Mycetophilidæ*, with like propensities, as evidenced by the genera *Mycetophila*, *Boletina*, *Mycetobia*, *Bolitophila*, and yet there are none so equally destructive or parasitic on Lichens.

These insects must have come to a sounder conclusion than some men, that Lichens are *not* Fungi, with the addition of an innocuous green Alga. Surely if they had the same grateful food to offer, these insects would patronise the Lichens; but as they attack all kinds of Fungi, and do not attack Lichens, insects certainly have not yet become converts to the Schwendenerian hypothesis.

In concluding these comparisons, the only inference which appears feasible is, that all these differences are so many reasons against the identity of Fungi with Lichens. There must be a most essential difference between them, beyond the gonidia, for the gonidia are not sufficient causes to produce all these divergencies. It is quite erroneous to state, as some have done, that the gonidia constitute the only difference between Lichens and Fungi, whereas the presence of gonidia is only one out of many differences which exist between them.

(To be continued.)

LICHEN FLORA.

We are happy in being able to announce that Rev. W. A. Leighton has nearly completed the printing of the *third* edition of his "Lichen-Flora of Great Britain, Ireland, and the Channel Islands," which it is expected will be ready for issue early in March. This new edition is rendered necessary by the marvellous discoveries of Mr. Larbalestier in the West of Ireland, those of Mr. Crombie, Dr. Stirton, and others in the North of Scotland, and his own researches in North and South Wales, whereby the Lichen-Flora of the former editions, amounting to 1,156, has been raised now to 1,706, thus rendering our Lichens, in number, rarity and novelty, quite equal to those of any country in Europe.

OBSERVATIONS ON SOME SPECIES OF NEAPOLITAN FUNGI.

By DR. O. COMES.

1. **Agaricus cæruleo-viridis.** Brig.—Hist. Fung. Neap., p. 9, t. 3, f. 1-2.

Fries did not quote in his work, "Hymen. Europ. Upsal., 1874," this species of fungus that was described by Briganti, and he in l.c., p. 43, gave the following reason:—"A. cæruleo-viridem, Brig., omitto, quum descriptio ad unguem cum A. æruginoso conveniat, exceptis lamellis albis; sed inter Pratellos sæpe vidi lamellas steriles persistenter albas, v.c. apud A. obturatum, udum, etc." At p. 9 of our preceding publication: "Funghi del Napolitano," we have clearly stated, in speaking of this fungus, that "le spore nei soggetti da me esaminati sono bianche" Briganti, moreover, in l.c. does not speak in a special manner of the spores; at most their white colour might be inferred from his having classified this fungus amongst the *Leucospori*. In the samples we examined we find spores, which are "ovato-ellittiche" and white, and have the dimensions of mm. $0,00608 \times 0,00365$. Cooke gives to the spores of the *A. æruginosus*, Curt., the dimensions of m. $0,00028 \times 0,0002$, equivalent in mm. $0,00711 \times 0,00508$. In this species, it not being the case of ascribing the white colour of the gills to their sterility, as Fries suspected, we believe that the species of Briganti ought to be put in the catalogue of "Hymenomyces Europæi," as it cannot be mistaken for *A. æruginosus*, Curt., because of the incompatibility of the colour of the spores.

2. **A. neapolitanus.** Pers.—(Pers. Myc. Enr. iii., p. 23, No. 112; Inzenga Fung. Sic. i., p. 14.—*A. coffeæ*, Brig., Hist. Fung. Neap., p. 81, t. 23-26).

This fungus of large dimensions lives in very special conditions, exclusively on coffee-mark, and it seems exclusively limited in the southern parts of Europe. Persoon himself described it from dry samples sent to him by M. Tenore, in 1876, accompanied by a letter published by Persoon, in a note in l.c., p. 74. Briganti in his work described fully this fungus, giving four plates of it, and having examined the fresh samples he was able to describe it better than Persoon; he preferred changing the old name into that of *A. coffeæ*. Therefore meanwhile these two names do not refer but to one single species and design exclusively the coffee fungus; yet there have been ascribed the above said names to two species which are without affinity between themselves, and quite different from the coffee fungus. In fact, in Fries' "Hym. Eur., p. 99, No. 300," the *A. neapolitanus*, Pers., is considered as a form of *A. catinus*, Fr., which lives between the leaves of the beech tree; and at p. 86, l.c., is found the *A. coffeæ*, Brig., referred to the *A. difformis*, Schum., which lives on the ground in a rich soil; both species are

common to Northern Europe. We have obtained fine clusters of coffee fungus on the coffee-mark kept in a damp locality, and we have observed that the characters given by Persoon and Briganti are entirely reconfirmed. These characters are always easily recognised, for from 1876 we have preserved a cluster in alcohol. Considering the constancy of form, and the special substratum on which this fungus lives, we believe that the species called *A. neapolitanus*, Pers., ought to be retained in the list of European Fungi.

3. **Ag. tuberaster.** *Brig. jun.*—(Comes, Fung. Nap., p. 113, tav. xiv., f. 4.)

The coffee fungus is very similar to the *Pietra fungaia* fungus, which Briganti jun., once observed on *Pietra fungaia*. But although from his unpublished works we have not been able to have an exact idea of the colour of the spores, yet from the characters given by Briganti we believe that the said species ought to be classified amongst the *Clitocybe*. We also have observed a very little fungus on the *Pietra fungaia*, very different from the *A. tuberaster*, Brig., and which we have named *A. Severini* (Fung. Nap., p. 92, tav. xiv., f. 7-8). Moreover, at p. 144, l.c., we wrote that also Micheli and Battarra had mentioned some fungi belonging to the *Pietra fungaia*, and which had gills; but we are sorry that they have not given the characters of these fungi, therefore we cannot make comparisons. We do not wonder, however, at the variety of forms of the fungi, which may live on the *Pietra fungaia*, because when the latter begins to decompose, it may certainly receive spores of the other fungi, and comport itself towards them as would any other decomposing organic substance.

4. **A. cardarella.**—(Fr. S. M. i., p. 84; Ejusd. Hym. Eur., p. 80.—Cooke et Quêlet Cl. syn., p. 19, No. 240.)

Fries made this species by the characters that were assigned by Battarra to a fungus commonly known as *Cardarella nostrana*, and which lives in the pastures of the Adriatic coast. It is collected in autumn, when ripe and when dry, and is esculent (Battarra, Fung. Arim. Hist., p. 38, t. xvi., G., *Omphalomyces fuscus*). We may, without further proof, assert that the fungus to which Battarra alluded is precisely the field *Eryngo Agaric* (*A. Eryngii*, DC.), which is collected in the pastures along the Adriatic, and which is sent from the Abruzzi (where it is called *Carderella*), and the Puglia (where it is called *Cardoncello*) to Naples, where it is sold dried, and strung in bundles on threads. But we prefer giving other direct proofs of our assertion. Fries had considered these species so closely allied, that he had placed them near, and had marked the *A. cardarella* with the No. 12, and the *A. Eryngii* with the No. 14 (Fr. S.M. i., p. 84, No. 12, 14). Also the diagnostic phrases correspond substantially the one with the other, differing in some secondary points, which refer to characters which are neglected in the *A. cardarella*, because the

description made by Battarra is incomplete. The latter neglected, in fact, to mention the irregularity of the pileus, although this irregularity is not constant, as Vittadini, speaking of the *A. Eryngii*, says only “di forma bene spesso irregolare” (Vitt. Fung. Mang, p. 71); and Fries himself says—“Pileus....varians centralis et lateralis” (Fr. Hym. Eur., p. 171). Battarra does not speak of the slight roughness of the pileus; but also Vittadini, at the l.c., says—“la superficie è un pò scabra.....e tal fiata..... affatto liscia.” If the skin is denoted as “crassa secernibile” in the diagnostic phrase of Fries (Hym. Eur., p. 80), Vittadini himself says, speaking of the *Eryngo Agaric* at the l.c., p. 72, that “l’epidermide è grossa e difficilmente sollevabile dalla carne sottoposta.” There remains only, therefore, the proof of the substratum, on which the *A. cardarella* lives. But, if Battarra does not speak of the root of the *Eryngo* (which abounds at Rimini and along all the Adriatic), we ought to remember that in autumn, if the root after the rains becomes rotten, the whole fungus may be gathered without any trace of the root, on which it grew, remaining attached to it. Moreover, the common name of *Cardarella nostruna* quoted by Battarra is sufficient to show us, that he is speaking exclusively of the *Eryngo Agaric*. In fact the said name in the Abruzzo and on all the Adriatic coast is given to that Agaric which lives on herbaceous plants with prickly leaves like those of the thistle. We have no doubt, therefore, that the species named *A. cardarella*, Fr., ought to be put between the synonymous names of the *A. Eryngii*, DC.—To the *A. Eryngii*, DC., marked with the No. 608 in the “Clavis. Hym.,” p. 49 (Cooke et Quêlet), follows, with the No. 606, the *A. nebrodensis*, Inz., and with the No. 607, l’*A. ferulæ*, Q. Concerning this last species we refer entirely to what we have written in N.B. at p. 20 of our publication. Therefore we believe that this species might be considered as a variety of the *A. Eryngii*, DC. But observing also that Cooke and Quêlet, in l.c., suspect that the *A. ferulæ* is a variety of the *A. nebrodensis* (“an varietas prioris?”), and that Fries retains it as a synonymous name (Fr. Hym. Eur., p. 703), therefore it seems that the *A. Eryngii*, DC., assumes a larger size when it lives on the other larger Umbelliferæ, as the *Ferula communis*, L., *Pragnos ferulacea*, DC., *Opoponax chironium*, Koch., *Eleoselinum Asclepium*, Bert.; therefore the *A. ferulæ* and the *A. nebrodensis* represent the largest form of the common *A. Eryngii*, DC. For this reason we have considered this form as a variety of the *A. Eryngii*, DC.; that is why we believe that it is not an independent species (Fung. Nap., p. 20).

5. **A. Aegirita.** Brig.—Fasc. I. di funghi litogr. Nap., 1824, tab. 1. Ejusd. Hist. fung. Neap., p. 68, et p. 131, tab. 32-33.

This species has been quoted under the name of the *A. Aegerita*, Fr. (Fr. Hym. Eur., p. 219; Ejusd. Epicr., p. 164.—Cooke et Quêlet, l.c., p. 67, No. 840.) In our publication at p. 28, we have evidently demonstrated the priority of the name given by Briganti.

There we have shown that the *A. strobiloides*, Brig. jun., is an abnormal form, having a pileus "rimoso-tessulato" of the *A. Aegirita*, Brig., qualified by Fries, who had no opportunity of examining fresh samples, with the following words:—"Species admodum singularis" (Hym. Eur., p. 219). Therefore we have considered this species as a variety of the *A. Aegirita*, Brig. (Fung. Nap., p. 25, t. vi., f. 1-8). Then also the species of *A. Briganti*, Fr. (Hym. Eur., p. 219; Cooke et Quélet, cl., p. 67, No. 841), correspondent with the *A. strobiloides*, Brig. jun., with the changed name, ought to be considered as a synonymous name of the *A. Aegirita*, Brig., var. *strobiloides*.

6. **Lentinus auricolor.** Fr.—(Fr. Hym. Eur., p. 473, No. 10; Cooke et Quélet, ee. syn., p. 187, No. 4). Fries has ascribed to the genus *Lentinus* the species of Agaric named by Briganti *A. auricolor* (Fasc. I. di funghi litogr. Napoli. 1824, tav. Q. ejusd. Hist. fung. Neap., p. 23, tab. 13.), an agaric which, living on several plants, and chiefly on the olive tree, in the countries of Southern Europe, in summer and in autumn. Yet the subjects we collected in the same locality named by Briganti correspond perfectly to the description of the *A. olearius*, DC. If Briganti had examined the subjects in the dark, he would have noticed the phosphorescence, as we in all cases have observed, and he would not have been induced into the error of making another species for an agaric already described. He therefore named this species *A. auricolor*, from the golden colour of the whole fungus. Micheli, in fact, says—"Fungus perniciosus, intense aureus, ex uno pede multiplex, ad oleam nascens. . . . Fungo olivo, dorato, malefico; Majo, Septembri, at Novembri mensibus per sylvas ad sepes, et in agris, præcipue ad oleas." (N. pl. gen., p. 191). And Fries says—"A. olearius, varius, rufo-aureus." (S. M., I., p. 273). There remains, therefore, no doubt as to the identity of the two species *A. auricolor*, Brig., and *A. olearius*, DC. In consequence of which also the *Lentinus auricolor*, Fr., ought to be retained as synonymous of the *A. olearius*, &c., as we had proposed in our publication at p. 17.

7. **Polyporus Ceratoniæ.**—Risso in Barla Champ Nic., p. 60, t. 30, f. 1-3; Fr. Hym. Eur., p. 552, No. 109; Cooke et Quélet Cl. syn., p. 179, No. 108.)

The diagnostic phrase of Risso in l.c., for the definition of this species, corresponds substantially with that quoted by Fries for the *P. sulphureus* (S. M., i., p. 357, No. 6); and Risso himself adds that the species he described has a great resemblance with the *Boletus sulphureus*, Bull., which he suspects may be a variety of this form, from which, however, it differs in the colour of the flesh, which is white. We are doubtful in giving too great an importance to the colour of the flesh, following the example of Fries, who, in Epic. Syst. Myc., p. 450, adds, in speaking of the *P. sulphureus*, "carnea flavida, dein albicante." Having had the opportunity of examining many fresh samples of the *Polyporus* that

live on the locust tree (*Ceratonia Siliqua*), we did not find sufficient characters to make it a distinct species; but, observing the tendency in the examined samples towards the simple form, and wanting to distinguish the latter, we prefer considering it as the simple and not cæspitose form of *Polyporus sulphureus*. We have continued during the present year our researches, and have found on the locust tree itself examples of Polypori no more simple, but cæspitose, and which, in form, spores, and colour of flesh, resembled other samples found on the Almond (*Amygdalus communis*) and other trees. The latter samples belong, without doubt, to the species *P. sulphureus*, Fr. It follows, from what has been said, that the only differential character of the simplicity of form of the locust tree polyporus being yet doubtful, we must conclude that the *P. Ceratoniae*, Risso, corresponds essentially with *P. sulphureus*, Fr., which is so polymorphous. But, moreover, to the samples collected on the locust tree corresponds the other characters given by Insenga to his *P. Todari*, for the aforesaid locust tree polyporus presents "il margine acutissimo, sporgergente, ondeggiante, e serpeggiante," as Insenga himself wrote to me (Fung. Nap., p. 107), "rivoltato un poco indietro nella sua estremità, di color miniato, molto carico . . . e formante una zona colorata e distinta per tutta la circonferenza del fungo" (Fung. Sic., I., p. 38.) As a last proof, we may add that the fungus of which Clusio speaks, exactly interpreted by Fries as *P. sulphureus*, is coloured in the following manner:—"Colores flavus et ruber simul mixti . . . extimæ oræ satura rubedine nitent" (Clus. Rar., pl. Hist., p. 278.) Therefore, if the same diagnostic characters are common to the three species of Polypori: *P. sulphureus*, Fr., *P. ceratoniae*, Risso, *P. Todari*, Ins., we are obliged to conclude that the said three species must be reduced to one, viz., to the old species, to the *P. sulphureus*, Fr.; and the *P. ceratoniae*, Risso, and the *P. Todari*, Ins., ought to be considered amongst the many synonymous names of the *P. sulphureus*, Fr.!

CONCLUSION.

We propose that the following species, of which we give the abbreviated diagnostic phrase, be considered in the list of the Hymenomycetes Europæi:—

1o. **A. cæruleo-viridis.**—Brig. jun.—Neap., p. 9, t. 3, f. 1-2 (sect. *Armillaria*).

Pileo carnosio, e campanulato expanso, lævi, viscoso, glauco; lamellis confertis, amoene lacteis; stipite ab annulo ad basium squamulis obducto, dilute glauco.

2o. **A. Neapolitanus.** Pers.—Myc. Eur., iii., p. 73; *A. coffeæ*, Brig. Nap. t. 23-26 (sect. *Clitocybe*).

Albus, cæspitosus, raro gregarius; pileo carnosio e plano depresso infundibuliformi, limbo tumidulo et incurvo; lamellis albis, inæqualibus, decurrentibus; stipite subcentralis, solido.—Provenit ex *Coffeæ* potus fæce.

3. **A. Tuberaster.** *Brig. jun.*—(Sc. ined.; Comes, fung. Nap., p. 113, t. xiv., f. 4). Sect. *Clitocybe*.

Pileo carnoso, flavescente, centro e depresso infundibuliforme, lamellis albis, inæqualibus, subdecurrentibus; stipite brevi, incurvo, crasso, basi rufescente.—Provenit e matrice Polypori Tuberastri.

We propose, moreover, to modify the said list in regard of the following species:—

1°. **Agaricus Cardarella.** *Fr.*—To be considered as a syn. of the *A. Eryngii*, DC.

2°. **A. Ferulæ.** (*Lanzi.*)—Q. id. id. id. *A. Eryngii*, DC., var. *Ferulæ*.

3°. **A. nebrodensis.** *Ins.*— id. id. id. id.

4°. **A. Aegerita.** *Fr.*—To which the preceding name (*A. Aegirita*, *Brig.*), ought to be substituted.

5°. **A. Brigantii.** *Fr.*—(Syn. *A. strobiloides*, *Brig., jun.*), to be considered as a syn. of the *A. aegierita*, *Brig.*, var. *strobiloides*.

6°. **Lentinus (Agaricus Brig.) auricolor.** *Fr.*—Id. id. id. *A. olearius*, DC.

7°. **Polyp. Ceratonixæ.** *Risso.* } Id. id. id. *P. sulphureus*, *Fr.*

8°. **P. Todari.** *Ins.*

Portici, Gennajo, 1879.

MYCOGRAPHIA.

The sixth part of this work, completing the first volume, is just issued, with the Title page and three Indices for binding. First, there is an Index of the figures in the order of publication. Next, a Systematic Index, placing the genera and species illustrated in systematic order; the large genus *Peziza*, in so far as it has yet been illustrated, being divided into subgenera, based on their natural affinities. Finally, there is an Alphabetical Index of all the species and synonyms which occur throughout the volume.

This first volume includes such of the Discomycetes as were termed by Fries the *Pileati*, and the commencement of the *Cupulati* with *Wynnea* and *Peziza* as far as the end of the section *Sarcoscypha*—that is, nearly all the species of *Peziza* with large sporidia.

The second volume is proposed to be issued in parts in the same manner, and it is anticipated that this will include all the species of *Peziza* which remain to be figured, with perhaps some small allied genera, if the former are not too numerous.

Whether the systematic arrangement will satisfy the inordinate craving for new genera, which has of late characterised Mycology, is doubtful; nevertheless, we could not accept the various genera already proposed upon the Continent on the basis of carpological characters only, in the face of the declaration of one of the

greatest naturalists of the age, that "it has been found that a classification founded on any single character, however important that may be, has always failed."

Any further observations on the scope or execution of the work it is not our province to offer. As interested parties we must rest content with an announcement of facts, leaving the volume to have its value determined by the test of experience.

NEW DIATOMS.

By Prof. P. T. CLEVE, with Notes by F. KITTON.

ADDENDA ET CORRIGENDA.

No. 11, p. 68, after favourable, insert "illumination."

No. 13, p. 69, *P. caribærun*, should commence a fresh paragraph. (No. 14a.)

No. 19, p. 70, after M.M.J. vol., insert "xii."

To follow No. 23, p. 70, 23a, *T. Antillarum*, Cl.—Small, 4 to 5 produced angles. Sculpture small, pearly granules, 7-8 in., .01 mm., arranged in straight radiating lines. The middle of the valve seems to be elevated and the angles obliquely projecting. Diam. .053 mm. Virgin Islands, St. Bartholomew. Rare.

[Herr Cleve's figure resembles the pentagonal var. of *Amphitetras antediluviana*, but it is very much smaller than any specimen I have seen of that species.—F. K.]

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Grevillea,

A QUARTERLY RECORD OF CRYPTOGAMIC BOTANY
AND ITS LITERATURE.

THE DUAL LICHEN HYPOTHESIS.

(Continued from Page 108.)

Are Gonidia a part of the Lichen-structure?—The thalli of Lichens enclose within them peculiar cellules, forming a sub-cortical layer, which are sub-globose, of a greenish colour, and to these the name of *gonidia* has been given. They frequently burst through, and appear on the surface, in the form of powdery masses. The lichenologist believes, and as he thinks has good reason for believing, that they form part of the plant itself. One says, "They may be regarded as intermediate in function between the vegetative and reproductive cell, assuming the offices and partaking of the characters of both."* The justly celebrated Tulasne considered them to be parts of the Lichen, and also to perform important functions. On the other hand, the theorists contend that they are no part of the plant, but that they are a form of Algæ, upon which the residue of the Lichen is parasitic. The grounds of the belief are supposititious, and the proof is still defective.

In the first place, it is argued that they are free cells, resembling in size, form, and colour certain low forms of unicellular Algæ, and hence, as they are out of place in Lichens, they must be unicellular Algæ.

Any one who has had any experience amongst the low forms of of vegetable life, in which the organism consists of a single cell, are exceedingly well aware that it is almost an impossibility, from the observation of these cells, to arrive at any satisfactory conclusion as to what they are, and what their ultimate development may be. Let them compare, if they please, what are known to be the earliest stages of Mosses and Algæ with the gonidia of Lichens, and draw up characteristic diagnoses if they can. All are globose cells containing a greenish protoplasm, and about equal in size. By what occult power can the theorists distinguish that which, it is admitted, they cannot describe? Yet the best and most experienced Algalogists affirm that of all these forms the gonidia of Lichens are the most distinct and permanent in their character.

* Lindsay, "Loc. Cit.," p. 41.

The only safe method by which these low forms can be determined, is by watching their development. In their simple condition of cells they are no more than mere buds, the ultimate form of which only the rash or foolish would predicate.

If the gonidia of Lichens are true Algæ, it is insufficient to state that they so closely resemble Algæ that they might be mistaken for such; there must be some undoubted evidence produced that they are Algæ in fact, and not in appearance.

Nylander, on the contrary, holds that they are organs belonging to the Lichen. He says, "I have adduced that the gonidia and gonimia of Lichens constitute a normal organic system necessary, and of the greatest physiological importance, so that around them we behold the growing (or vegetative) life chiefly promoted and active." Again he says, "The absurdity of such an hypothesis is evident from the very consideration that it cannot be the case that an organ (gonidia) should at the same time be a parasite on the body of which it exercises vital functions."*

Now, it must be admitted that Dr. Nylander is the *facile princeps* of Lichenologists. If it can be shown that these green cells perform an active part in the life of the lichen—in fact, that they are organs possessed of certain functions, then they cannot at the same time be foreign to the plant in which they occur. Nylander has shown that, whenever they are few in number, a proportionate decrease of vitality takes place. That the most vigorous functions of life are carried on in their proximity.

As the Schwendenerian theory is wholly based on the belief that there is no genetic relationship between the hyphæ and the gonidia of the Lichen thallus, any proof that such a genetic relationship does exist is fatal to it. Dr. Minks, of Stettin, has directed his attention specially to the investigation of this point with very important results. He discovers in the hyphæ of Lichens two new organs, which he has designated *geonangium* and *gonocystium*, which produce gonidia within the walls of the hyphæ themselves. These gonidia, because of their minuteness, he names *micro-gonidia*. He has seen these *micro-gonidia* in all the cells of the hyphæ, whether in the vegetative or the reproductive parts. He sees them in the cortical layer, the medullary layer, the paraphyses, the young asci, the sporidia, &c. Thus he has established their existence, not only within the hyphæ-cells of all parts of the Lichen, but also in all stages of its life-history.

These facts, so utterly subversive of the Schwendener theory, have likewise been observed and confirmed by Dr. Muller, of Geneva, who says, "My results have surpassed my highest expectations. Not only have I proved the existence of micro-gonidia in all the organs mentioned above, after having treated them with caustic potash, sulphuric acid, and tincture of iodine, but I have also seen them with my excellent immersion objectives, without any

* Nylander, in "Grevillea," ii., p. 146, 147.

chemical preparation; and in favourable cases, I have even seen them with the non-immersion lower powers of Hartnack." He proceeds to say that these micro-gonidia are paler than the ordinary gonidia, and disposed in moniliform series in the axes of the hyphæ, having a diameter of $\cdot 001$ mm. In certain tropical species, which had been exposed to a more vivid light than those in more northern latitudes, these micro-gonidia attained a brighter green; for example, in *Parmelia prolixa*, var. *erythrocardia*, Müll., sent by Dr. Schweinfurth from Lake Nyanza, in Africa. In this Lichen they were so green that little difference of colour existed between them and the gonidia.*

If the "parasite" can produce within itself all which it requires for its existence, then Nature has made a mistake in making it dependent on another being for its existence.

Here, then, we have clear demonstration that the gonidia are developed within the substance of the Lichen itself in a determinate and uniform manner; that, instead of being altogether foreign from the Lichen, they are generated within it, and hence (according to the hypothesis) the parasite produces from its own substance the host upon which it is parasitic.

The admirable Memoir of Tulasne should be consulted in conjunction with Dr. Minks's contributions to the "Flora," and it will be seen that the latter confirms and amplifies the former, adding thereto new facts, and thus, doubtless, establishes the true relationship of gonidia to the residue of the Lichen.

I am compelled to be suggestive, rather than exhaustive, in dealing with such an expansive subject, which I scarcely regret here, because it bears less intimately than others upon that phase of the subject in which I am naturally most interested.

Is Parasitism proven?—A parasite is usually defined as an animal or plant which lives upon or attaches itself to another, and derives therefrom sustenance and support. The mistletoe, which attaches itself to poplar and other trees, is a parasite. The mould which attacks and destroys potatoes, is a parasite, entozoa are parasites, and so also are the pediculi, and other insects which infest the higher animals. In ordinary conversation there is seldom likely to be any misconception of what is a parasite. In all known instances of parasitism, it is, I presume, admitted that the parasite thrives and flourishes at the expense of its host. In every known instance of parasitic fungi the fungus lives at the expense of its host, which it injures and ultimately destroys. Schwendener himself says, "the vine and potato fungus, as well as *all other fungi* which vegetate in living organisms, destroy their host plant, or host animal, in the unequal struggle." This universality of destructive parasitism in fungi knows no exception, and is, therefore, equivalent to a natural law. Any hypothesis which depends upon fungal parasitism, *must* of necessity recognize this fact, and conform to it. The fact cannot be reversed to save the hypothesis.

* Consult Minks on Micro-gonidia, in the "Regensburg Flora," for 1878.

Our experience of fire, in whatever form it occurs, is that it burns or consumes that upon which it operates. We have no experience of fire which does not support itself by causing that change of form and condition which we term combustion. Hence we are justified by experience in rejecting any theory based upon a reversion of this fact, that is, on the assumption that fire does not consume.

Inasmuch as the supposed fungus, said to be parasitic upon the gonidia, does not "destroy its host plant, in the unequal struggle," it cannot be a fungus, since, if it were a fungus, the gonidia would be destroyed, as demonstrated by experience. Or, if it were proven to be a fungus, then, not being parasitic, the gonidia are not foreign to it, but a portion of its substance; and again a dilemma occurs, for no fungus is known persistently to enclose green granules. Relative size is another strong presumption against parasitism. In the Lichen we have a supposed parasite many times larger than its host. It is an elephant parasitic upon a flea, and not a flea upon an elephant. The parasite in the romance encloses and cherishes its host, which is buried within its substance, reminding one strongly of an entozoon, enclosed in the body of an animal, horse, dog or man. In such a case it is not usual to call the man or the animal the parasite, and the entozoon the host, but the reverse. If it is urged that this is not an analogy, because the entozoon is known to subsist upon the animal in which it is found, then, in like manner I would urge that it is not proved that the gonidia do not subsist at the expense of the so-called fungus. In other words, it is more feasible to suppose that the assumed green algæ are parasitic than that they should be the host.

Again, if it can be shown that gonidia are part of the whole plant, they cannot be distinct from the plant. If they are produced *by* the healthy and normal action of the plant, then they are attributes of the plant. If they are beneficial to the plant, acting as organs, performing useful functions, then there is no more parasitism than in the leaves of an oak or the tendrils of a vine.

It is needless to recapitulate what has already been alleged that the gonidia *are* generated by the plant itself, and hence there can be no parasitism.

Dr. Nylander writes: "The absurdity of such an hypothesis is evident from the very consideration that it cannot be the case that an organ (gonidia) should at the same time be a parasite on the body of which it exercises vital functions; for with equal propriety it might be contended that the liver or spleen constitutes parasites of the mammiferæ. Parasitic existence is autonomous, living upon a foreign body, of which nature prohibits it from being at the same time an organ."*

All conclusions as to the general character of Lichens, based upon experiences of the Colleniaceæ, are essentially unsatisfactory.

* "Grevillea" ii, p. 146.

It is widely admitted, and has been for many years, that the Collemaeae are aberrant forms of Lichens, even if they be Lichens at all. The genera *Collema*, *Leptogium*, *Synalissis*, *Myxopuntia*, *Omphalidium*, *Paulia*, *Lichina*, and *Myrrangium* have been named together, as forming a group with the thallus of an Alga and the fruit of a Lichen. Some have excluded them from Lichens altogether, others have accepted them with reserve, as aberrant forms, and all this was done before any Schwendener hypothesis was dreamt of. Montagne and the Rev. M. J. Berkeley at one time were disposed to include all these genera under the name of *Collemaeae*, as distinct from Lichens proper. (See "Lindl. Veg. King.," p. 49). Cohn afterwards excluded them in a proposed arrangement. Hence we may conclude, that whether they are included with Lichens or not, they are aberrant forms, in no sense typical of Lichens, and cannot be held as evidence in any dispute as to the character of Lichens as a whole.

Weighed and found Wanting.—It only remains to sum up the evidence and apply it to the purpose for which the foregoing remarks were designed.

It is perfectly legitimate to construct an hypothesis with the view of ascertaining the truth, but it appears to me that such an hypothesis should be tested in three ways. It should be considered as demonstrated, on the one hand, or be rejected, altogether, on the other, if it stands or falls by these three tests:

I.—We should be prepared to ascertain whether our hypothesis is consistent with existing scientific facts.

II.—Whether the hypothesis is sufficient to account for the phenomena in question.

III.—Whether the phenomena can be produced in any other manner.

I.—As to the harmony of the hypothesis with existing scientific facts. The assumption that two separate and distinct organisms are combined in one plant, which, by its own proper system of reproduction, is capable of continuing its species, each individual of its progeny also exhibiting the same phenomena of assumed dual existence, is inconsistent with known scientific facts, because, whilst one supposed plant proceeds from its proper germ, the other has none, and is, therefore, spontaneously evolved.

Thus, if the Lichen, by means of sporidia, is capable of producing plants which are, in all respects, like the parent, then the sporidium of the fungus element reproduces also the algal element, and the same spore, or ovum, is the origin of two distinct and widely diverse organisms, *i.e.*, a fungus and an Alga, which is inconsistent with scientific fact.

The seed of the maple reproduces the Maple tree only, its parasite, the *Rhytisma*, establishes its parasitism afterwards by means of its own proper spores. Thus it is with other hosts and other parasites. If one germ is the origin of both the dual

elements in a lichen, then these elements must both be considered as parts of a single individual.

The theory assumes, further, that a fungus is parasitic upon a smaller and weaker organism, which it does not injure or destroy. This, again, is contrary to scientific fact, as it confers upon, or assumes for, a destructive force, conservative powers.

The hypothesis assumes also that *all* the substance of *all* lichens, except the gonidia, are fungi, whereas, as has been shown, their structure, composition, habits, &c., &c., all differ materially from fungi, to such a degree, that they cannot be regarded as identical.

The hypothesis assumes also that the gonidia are certain forms of other plants, which they externally somewhat resemble, whereas the gonidia are organs of the lichen, performing definite functions in its behalf.

Hence, briefly, there remains no other conclusion but that the hypothesis fails to support the first test, because it is not consistent with existing scientific facts.

II.—Whether the hypothesis is sufficient to account for the phenomena in question. That is, whether the combination of a fungus and alga is sufficient to account for the production of a lichen, or to state the hypothesis in the phraseology of its advocates, whether a fungus parasiticon an alga is a sufficient cause to account for a Lichen.

Unless it can be shown that the fact of its parasitism is sufficient to alter the entire character of a fungus, it is *not* a sufficient cause to account for the existence of Lichens. Unless it can be admitted that parasitism will convert a fugitive, short-lived fungus into a perennial lichen, induce it to live on a dry, barren rock, which, as a fungus, it could never accomplish, to support great extremes of heat and cold, to submit to frost and snow without destruction, to flourish on growing trees, whilst still vigorous, and without inducing decay, to assume a fibrous structure instead of a cellular, to produce certain acids within its tissues, which are unknown to it in other conditions, to exchange a putrefactive tendency for a persistent one, to abandon for ever a career of pertinacious destructiveness for one of inoffensiveness, in short, to reverse its entire character, unless it can do all these things as a result of parasitism on the minute green cells of an Alga, then the fact of such a parasitism is insufficient for the production of the phenomena.

Inasmuch as we have no experience of such a total change in the essential characters of fungi under any conditions of climate, or local circumstances, we cannot admit that simple parasitism will cause such a change. Numerous instances of parasitism are found habitually to occur amongst fungi. Many species exist in no other form than as parasites, and yet no alteration in the direction of lichens is known to take place. Therefore we are compelled to adopt the conclusion that the hypothesis is insufficient to account for the phenomena in question.

III.—Whether the phenomena can be produced in any other

manner. It is almost needless to say much under this head, having already shown, as we proceeded, that all the phenomena of lichen life are wholly compatible with the assumption that these organisms are, in themselves, true, simple, autonomous plants. If, also, we are right in the conclusion that the hypothesis fails when submitted to the two preceding tests, the natural inference will be from the arguments already adduced, that all the phenomena which any Lichen exhibits are compatible with a simple organism. The Theorists admit, by their hypothesis, that all the phenomena, except the gonidia, are wholly compatible with a plant which they call a *Fungus*. Although we do not admit that *Fungus* is the correct name to be given to the plant, we also affirm that it affords evidence of being a simple plant, but with the addition of the gonidia, which we hold to be as possible as gonidia enclosed within the substance of a *Fistulina* or a *Polyporus*, and not only possibly, or even, probably, organs of the Lichen, but that *positively* such is the case. We require no counter hypothesis, therefore, to support our view, but urge, on the contrary, that where an organism is seen to exist, and continues to reproduce itself in conformity with a certain type, it is folly to attempt, by multiplying causes, to account for phenomena in an abnormal manner, which can be readily accounted for by normal causes.

When we see an organism in possession of certain organs, which organs perform certain functions, however small, and these organs and functions are inherited and transmitted, there is a pretty strong presumption that all our efforts to demonstrate external causes, to account for phenomena already well accounted for, we shall only embark on a profitless speculation. At present there are still a few who are content with this view of the Lichens, and do not crave the novelty of a dual hypothesis.

I cannot forbear indicating what I consider so often a source of error in questions of this kind, which is, the mistaking of *analogy* for *identity*. Unless I am much mistaken, that error is not absent from this hypothesis. Fungi of that division known as the Ascomycetes, have a certain kind of reproductive organs. The sporidia, normally eight, are contained in elongated sacs, called asci, which are placed side by side, mixed with other thread-like bodies, called paraphyses, and these together constitute the hymenium. Because, in Lichens, a like system of reproductive organs prevail; instead of accepting Lichens as analogous to Fungi in their reproduction, it is assumed, without proof, that they are identical.

Again, certain Fungi, called the *Discomycetes*, have these reproductive bodies enclosed in an open receptacle, like a cup; because certain lichens have also their reproductive organs enclosed in a receptacle of a similar form, though not of the same internal structure, instead of recognising this as an analogy, the theorists at once assume identity, and, practically, they argue thus. Certain Fungi have spores enclosed in asci, so have the Lichens, ergo the Lichens are Fungi. Certain Fungi have their reproductive organs

enclosed in cup-shape receptacles, so have certain Lichens, ergo, Lichens are Fungi. But lichens enclose in their thallus green bodies not found in Fungi, hence the Lichens are Fungi, enclosing green bodies which are foreign to it. There must be something wrong somewhere, what are these round, unicellular, greenish, free vesicles. Some of the unicellular Algæ consist of round, unicellular, greenish, free vesicles. Ergo, these gonidia are algæ. There must be parasitism somewhere with a Fungus, and a Lichen in the same plant, and thus the dual Lichen hypothesis is ushered upon the world, based on a tissue of analogies, mistaken for identities.

How aptly may an observation, made by Professor Huxley, when considering another hypothesis, be applied here : " In a scientific enquiry a fallacy, great or small, is always of importance, and is sure to be, in the long run, constantly productive of mischievous, if not fatal results."*

It is, undoubtedly, a fallacy to assume that things which are only analogous are identical, as if there were no real difference between analogy and identity. In the present instance no more decided evidence need be given than in the case of the gonidia. It has been deemed unnecessary to demonstrate that they are Algæ, but simply on the faith of their analogy has identity been assumed. The interests of truth demand that fallacies should be encountered, and not accepted on the faith of any authority whatever, be that authority ever so great, or ever so highly esteemed amongst men. Broken-down theories are, by no means, unknown in the Annals of Science, and the addition of another will create no great surprise. Some may remember the elaborate treatise of Professor Meneghini, in 1845, translated for the Ray Society in 1853, in which he essayed to prove the animal nature of Diatoms, a theory which at once found adherents, and it came nigh to being pronounced one of the great discoveries of science, and yet no one believes it now.

Or even the more recent theory of spontaneous generation, supported by the overwhelming evidence of the experiments of M. Pouchet. Yet the evidence and the theory collapsed, thanks to the indomitable perseverance of M. Pasteur, but not before it had acquired many adherents, and even in England scientific journals, of no small repute, announced it as one of the great discoveries of the age.

And not many years since the theory of the animal nature of the Myxogasters obtained the support of some botanists and many zoologists, although the mycologists generally declined to accept it. Perseverance has established the fallacy of the theory, but the lesson it suggests is evident, when we remember that the same individual who propounded that theory was the first to announce and propose the Algo-lichen hypothesis, which was taken up by Schwendener and afterwards by Bornet. A third proposition from the same source died without a friend.

* Huxley, " Lectures " (1863), Hardwicke, pp. 67.

Truly we may say—

“Science has bubbles, as the water hath,
And these are of them.”

Despite the announcement of the President of the Royal Society, for whom personally no one has a greater esteem than myself; despite the flourish in the pages of the “Nineteenth Century,” I not only dare to call in question, as vigorously as I can, the soundness of this doomed hypothesis, but to prognosticate its dissolution. Doomed, I say, advisedly, because, being illogical and unsound, it must, sooner or later, the sooner the better, go “into liquidation.”

It is worthy of note how conclusions are assumed without examination or enquiry, but entirely, as one might say, developed out of inner consciousness. Thus in the “Gardener’s Chronicle” (Feb. 1, 1879, p. 146), it is said: “Some of Reinsch’s observations include some curious instances of one alga parasitical in the thallus of another, thus strengthening the algo-lichen theory of Schwendener and others.” Now this is a logical fallacy. Parasitism is, probably, not at all uncommon in Algæ. It is very possible that the fact is true, but how does it follow from the premises that this conclusion is to be arrived at?

I.—One alga may be parasitic in the thallus of another.

II.—A fungus is parasitic on an alga in lichens.

III.—Therefore the fungus is an Alga. Is this the argument? or what is it? because it is not affirmed that an Alga is parasitic in the thallus of a lichen, but that the Alga is the host. Some things seem to have got a little mixed somewhere when the above paragraph was written. I have not appealed to authorities, or marshalled the names of those who refuse to be parties to the “scare,” because of the weakness of such a course of argument; but, as I draw to a close, I may justify my position by again enquiring how it is that this hypothesis is not accepted either by the lichenologists or the mycologists. Why are its strongest advocates and most persistent supporters those who, from their own writings, give evidence that they have but an exceedingly small practical acquaintance with either lichens or fungi? The whole controversy, in so far as its advocacy is concerned, teems with errors such as practical lichenologists and mycologists could not have made. There can be no truer test of a man’s knowledge than to permit him to write away at his own sweet will. Believe me, it is not by any means difficult to determine the shallowness of a man’s knowledge, if he is only permitted to write and talk as he pleases. I have very little doubt, indeed, that the great reason why this theory has been so little opposed, lies in the conviction which I have shared with others, that if only it is let alone it will commit suicide. The internal evidence is so strong, be the theory true or false, that its chief advocates have not had the practical knowledge which they ought to have possessed, that I am not in the least surprised that those who are best acquainted with fungi and lichens did not deem

such opponents either dangerous, on the one hand, or worthy foes for personal combat on the other.

Whether that hypothesis be true or false which he originated, we have, at least, the honour of having produced in England the greatest master of the art of expounding and constructing an hypothesis which any country has produced. Had the Schwendenarians studied carefully the "Origin of Species," they would have less signally failed. His sternest opponents credit Darwin with the production of a marvellous work of art in the elaboration of his hypothesis. Their best friends are silent in their commendations of Schwendener and Co.

As to the assertion that the hypothesis is now generally received and adopted, come from what quarter it may, must be accepted for what it is worth; even if endorsed by the "Nineteenth Century" it will certainly be forgotten in the twentieth. Such an hypothesis cannot practically be accepted whilst it is rejected by the Lichenologists and Mycologists. It must resolve itself into a question of classification, and so long as the best classificatory books are written by the best men, Lichens will continue to be Lichens, and Fungi much the same as they are.

The discontented lawyer may desire to extend his sphere of operations for the benefit of the community, and elaborate some theory of his own that "Measles" is only incipient "Gout," or "small-pox," a degenerate perspiration, to be corrected by copious draughts of cold water. Still, it would avail nothing to the medical man if all the scientific journals in London were to declare it a marvellous discovery in science. The physician would have his own opinion in the midst of the chaos, even of the capacity of the man of law to decide for the man of physic, and whether, as Carlyle expresses it: "Oceans of horse-hair, continents of parchment, and learned sergeant eloquence, were it continued till the learned tongue wore itself small in the indefatigable learned mouth," could not make measles gout.

So is it with this hypothesis, which has been constructed to set right the wrong-headed Cryptogamists, it may get a little false popularity from those who know no better. But, as for my friends, they may rest assured that when I have shuffled off this mortal coil they will be able to say, with confidence, that amidst all my follies and crimes, I was never the advocate of the theories of Table-turning, Tichborne, or Schwendener.

M. C. COOKE.*

FRIES'S ICONES.—We omitted to state in our last that the publication of this work has been resumed, since the death of the venerable Elias Fries, under the editorship of his sons.

* Communicated to the "Quekett Microscopical Club," March 28, 1879; in reply to recent advocates of the Theory.

NEW BRITISH FUNGI.

By M. C. COOKE.

*(Continued from Vol. vi, p. 128).***Agaricus (Lepiota) amianthinus.** *Scop. var. Broadwoodiæ.*

Pileus hemispherical, yellow, delicately tomentose; margin inflexed; stem equal, and, as well as the ring, mealy; gills white, adnate, sometimes decurrent.—*B. & Br. Ann. N. Hist., No. 1730**.

On the ground. Lyne (Sussex).

A very distinct variety, if not species.

Agaricus (Lepiota) mesomorphus. *Bull, t. 506, f. 1.*

Pileus rather fleshy, campanulate. Stem fistulose, short, thin, even and smooth as well as the pileus; ring erect, persistent; gills free, ventricose, white.—*Fr. Mon., p. 38. B. & Br. Ann. N. H., No. 1731.*

On the ground. Hereford.

Agaricus (Lepiota) medullatus. *Fr. Hym. Eur., 38.*

Pileus fleshy, convex, plane, umbonate, smooth, viscid, margin dentate with fragments of the veil; stem at length fistulose, obsoletely squamulose below the ring; gills free, crowded, ventricose.—*Fr. Ic., t. 16, f. 2. B. & Br. Ann. N. H., No. 1732.*

On the ground. Glamis, N.B.

Agaricus (Tricholoma) inamænus. *Fr. S.M., 1, p. 111.*

Var. *a.* Gills decurrent, very distant.—*B. & Br. Ann. N. Hist., No. 1733*.*

On the ground. Coed Coch.

“The smell is so precisely like that of the normal *A. inamænus*, that I follow Fries in considering it a mere variety.”—*M. J. B.*

Agaricus (Clitocybe) rivulosus. *P. Syn., 369.*

Pileus convex, then plane, depressed, rather compact, obtuse, becoming pale, smooth, at length rivulose; stem stuffed, tough, elastic, subfibrillose; gills adnato-decurrent, broad, rather crowded, flesh coloured, then white.—*B. & Br. Ann. N. H., No. 1734.*

By the grassy side of a road. Coed Coch.

Agaricus (Clitocybe) Sadleri. *Berk.*

Cæspitose, strong scented, pileus plano-depressed or umbilicate, yellow, centre brownish, at first silky, then growing smooth in the centre; stem thickened downwards, yellow, clad with brownish fibrils, becoming smooth; gills lemon-yellow, thin, very much crowded, decurrent, margin quite entire.—*B. & Br. Ann. N. H., No. 1734 bis.*

On an oak tub in conservatory. Edinburgh.

Pileus 2-2½ in. Stem 3-4 in., ½ in. thick, except at the base. Allied to *A. illudens*, Schwz. Taste intensely acrid.

Agaricus (Clitocybe) aggregatus. *Schæff., t. 305, 306.*

Flaccid. Pileus fleshy, convex, then expanded, equal, repand, shining, at length becoming pale, rather silky streaked; stem stuffed, unequal, rather fibrillose, attenuated downwards; gills unequally decurrent, crowded, becoming yellowish flesh colour.—*B. & Br. Ann. N. H., No. 1735.*

Abundantly on sawdust. Coed Coch.

Agaricus (Clitocybe) tuba. *Fr. Hym. Eur., 99. Icon., 51, f. 2.*

White. Pileus fleshy, thin, convexo-plane, umbilicate, when dry becoming whitish with silky shining particles, margin even; stem equal, soon hollow, and compressed, naked above; gills deeply attenuated and decurrent, broad, much crowded, white, then pallid.—*B. & Br. Ann. N. H., No. 1736.*

Amongst leaves. Coed Coch.

Agaricus (Clitocybe) pausiacus. *Fr. Hym. Eur., 104. Icon., t. 58, f. 2.*

Strong scented. Pileus rather fleshy, convex, then plane or depressed, even, hygrophanous; stem somewhat hollow, equal, striate, whitish pruinose above; gills obtusely adnate, semi-circular, crowded, becoming somewhat olive coloured.—*B. & Br. Ann. N. H., No. 1737.*

In pine woods. Coed Coch.

Agaricus (Clitocybe) obsoletus. *Batsch, f. 103.*

Slightly fragrant. Pileus rather fleshy, convex, then plane or depressed, even, smooth, hygrophanous, stem stuffed, then hollow, elastic; gills obtuse, adnate, broad, crowded, whitish.—*B. & Br. Ann. N. H., No. 1738.*

Grassy side of road. Coed Coch.

Agaricus (Collybia) semitalis. *Fr. Hym. Eur., 111.*

Pileus between fleshy and membranaceous, convexo-plane, obtuse, smooth, moist; stem fibrous, stuffed, fibrillose striate, with a membranous cartilaginous cuticle; gills obtusely affixed (with a decurrent tooth) distant, distinct, white, becoming blackish when touched.—*B. & Br. Ann. N. H., No. 1739.*

By the bare side of the road. Coed Coch.

Agaricus (Collybia) hariolorum. *Bull, t. 585, f. 2.*

Pileus rather fleshy, campanulate, then hemispherical, plane, or depressed, smooth; stem hollow, attenuated upwards, rufescent woolly; gills adnexed, nearly free, rather crowded, narrow, white, becoming pallid.—*B. & Br. Ann. N. H., No. 1740.*

In woods. Coed Coch.

Agaricus (Collybia) ventricosus. *Bull, t. 411, f. 1.*

Pileus rather fleshy, campanulate convex, umbonate, smooth, stem hollow, even, naked, rufescent, ventricose at the base and rooting; gills arcuate adnexed, ventricose, rather crowded, undulate, at length rufescent.—*Fr. Hym. Eur., 120. B. & Br. Ann. N. H., No. 1741.*

In woods. Coed Coch.

Agaricus (Collybia) nitellinus. *Fr. Hym. Eur.*, 120. *Icon.*, t. 65, f. 1, 2.

Pileus rather fleshy, convex then expanded, even, tawny, shining, hygrophanous; stem slightly fistulose, unequal, rigid, smooth, tawny; gills adnate, thin, rather crowded, white, becoming pallid.—*B. & Br. Ann. N. H.*, No. 1742.

By roadsides. Shrewsbury.

Agaricus (Collybia) nummularius. *Bull.*, t. 56.

Pileus rather fleshy, almost plane, obsoletely depressed around the umbo, even, pallid; stem stuffed, then hollow, smooth, pallid, incrassated above; gills free, rather distant, white.—*B. & Br. Ann. N. H.*, No. 1743.

Amongst leaves. Glamis, N.B.

Agaricus (Collybia) stolonifer. *Jungh. Lum.* 1830, 396.

Pileus rather fleshy, somewhat plane, obtuse (almost depressed) smooth, margin slightly striate, stem fistulose, equal, smooth, becoming brownish, with a creeping root; gills rounded adnexed, ventricose, rather distant, whitish.—*B. & Br. Ann. N. H.*, No. 1744.

Amongst fir leaves. With *Marasmius porreus*.

Agaricus (Collybia) tosquorum. *Fr. Hym. Eur.* p. 128.

Pileus rather fleshy, convex, then plane, obtuse, even, dark brown, becoming pale; stem fistulose, thin, brown, pruinose above; gills free, ventricose, rather distant, greyish-brown.—*B. & Br. Ann. N. H.*, No. 1745.

In open pastures. Ascot.

Agaricus (Mycena) tintinabulum. *Fr. Hym. Eur.*, p. 140.

Icon., t. 80, f. 4.

Pileus rather membranaceous, campanulate convex, somewhat obtuse and smooth, of one colour, viscid when moist; stem rigid, tough, even, smooth, pallid, with rooting threads; gills with a decurrent tooth, crowded, plane, thin, whitish.—*B. & Br. Ann. N. H.*, No. 1746.

On trunks. Glamis N.B.

Agaricus (Mycena) leptocephalus. *Pers. Ic. et Desc.*, t. 12, f. 4.

Fragile, with a nitrous odour. Pileus rather membranaceous, campanulate then expanded, repand, umbonate, sulcate, pruinose, opaque; stem equal, striate, opaque, dry; gills emarginate, whitish grey.—*B. & Br. Ann. N. H.*, No. 1747.

On trunks and the ground. Laxton Park.

Agaricus (Mycena) plicato-crenatus. *Fr. Hym. Eur.*, 150, *Icon* t. 84, f. 2.

Pileus very thin, conical, somewhat umbonate, sulcate, plicate and toothed, white then yellowish; stem thread-like, smooth viscid, pale reddish; gills ascending, attenuated, adnate with a decurrent tooth, distant, white.—*B. & Br. Ann. N. H.*, No. 1748.

Amongst heath. Coed Coch.

Agaricus (Mycena) clavicularis. *Fr. Sys. Myc.*, 1, 158.

Pileus membranaceous, convex, then expanded, striate, dry, without cuticle, disc at length depressed; stem tough, smooth, viscid, whitish, fibrillose at the base; gills adnate, white.—*B. & Br. Ann. N. H.*, No. 1749.

In woody places. Glamis N.B.

Agaricus (Omphalia) umbelliferus. *L. var. viridis Fl. Dan.* t. 1672, f. 1.

On the ground. Kings Lynn.

Agaricus (Omphalia) retostus. *Fr. Icon. t.* 76, f. 2.

Umber. Pileus rather fleshy, plane, then depressed, even when moist, polished when dry, smooth, growing pale, margin involute, entire; stem fistulose, tough, smooth; gills slightly decurrent, broad, distant, paler.—*B. & Br. Ann. N. H.*, No. 1750.

On lawns. Coed Coch.

Agaricus (Omphalia) abhorrens. *B. & Br.*

Tawny brown, very fetid, caespitose; pileus umbilicate, even; stem slender, base white tomentose; gills distant, thick, decurrent, with the interstices even.—*B. & Br. Ann. N. H.*, No. 1751.

On the lawn. Coed Coch.

“Closely allied to *A. retostus*, but clearly distinct, apart from its disgusting smell; stem sometimes pruinose when young.”

Agaricus (Omphalia) pseudo-androsaceus. *Bull. t.* 276.

Whitish or grey. Pileus between fleshy and membranaceous, convex, deeply umbilicate, at length infundibuliform, smooth; striate plicate, margin crenulate; stem stuffed, slender; gills deeply decurrent, segment-like, distant, distinct.—*B. & Br. Ann. N. H.*, No. 1752.

On the lawn. Coed Coch.

Agaricus (Omphalia) bullula. *Brig. t.* xvi., f. 1.

Scattered, small, wholly white; pileus membranaceous, hemispherical, diaphanous; gills arched, decurrent, stem very thin, filiform.—*B. & Br. Ann. N. H.*, No. 1753.

On dead sticks. Coed Coch.

Agaricus (Pleurotus) Ruthæ. *B. & Br.*

Pileus flabelliform, upper stratum gelatinose, rather hispid, whitish; margin very thin, striate; stem short, lateral, hispid; gills white, rather broad, acute and anastomosing behind, reddish as well as the stem, interstices veined.—*B. & Br. Ann. N. H.*, No. 1754.

On Sawdust. Coed Coch.

Pileus $1\frac{1}{2}$ in. across, colour dirty white, with a hyaline aspect, mycelium fibrous.

Agaricus (Pleurotus) reniformis. *Fr. Hym. Eur.*, 177, *Icon.*, t. 89, f. 3.

Pileus rather fleshy, horizontal, reniform, plane, cinereous, emarginate behind, with a very short rudimentary villous stem; gills excurrent and diverging from a stem-like tubercle, thin, linear, grey.—*B. & Br. Ann. N. H.*, No. 1755.

On sticks. Glamis, N.B.

Agaricus (Pleurotus) flexilis. *Fr. Hym. Eur.*, 180.

Sessile Pileus rather fleshy, reniform, gelatinous and viscid above, somewhat umber; gills linear, diverging from a lateral point, distant, whitish, few, entire—*B. & Br. Ann. N. H.*, No. 1756.

On trunks amongst moss. Glamis, N.B.

Agaricus (Volvaria) temperatus. *B. & Br.*

Pileus convex, umbonate, pulverulent, striate; stem slender, pellucid; volva broad.—*B. & Br. Ann. N. H.*, No. 1757.

On soil in a greenhouse. Sibbertoft.

Pileus $\frac{1}{4}$ in. across; stem 1 in., not 1 line thick.

Agaricus (Clitopilus) stilbocephalus. *B. & Br.*

Pileus campanulate, obtuse, sometimes umbonate, hygrophanous, when dry white and rather silky; margin straight; stem hollow, nearly equal, silky-fibrous; gills broad, adnate, sometimes emarginate behind, veined.—*B. & Br. Ann. N. H.*, No. 1758.

Ascot.

Pileus sparkling.

Agaricus (Leptonia) nefrens. *Fr. S. M.*, i., 209.

Pileus membranaceous, convex, then plane, at first umbilicate, without striæ, squamulose, sooty-brown, hygrophanous; stem stuffed, rather firm, even, punctate with black above, mealy; gills adnate, plane, segmentoid, rather distant, grey.—*B. & Br. Ann. N. H.*, No. 1759.

In grassy places. Ascot.

“Odour not farinaceous. Exactly *A. nefrens*, with the exception of the dark margin of the gills.”

Agaricus (Nolanea) infula. *Fr. Hym. Eur.*, 210. *Icon.*, t. 100, f. 1.

Very tough. Pileus membranaceous, conical, then expanded, papillate, shining, rather even, hygrophanous; stem somewhat hollow, rigid, smooth, naked, tawny; gills thin, narrow, very crowded, white, then rosy.—*B. & Br. Ann. N. H.*, No. 1760.

On the lawn. Coed Coch.

Agaricus (Inocybe) phæocephalus. *Bull.*, t. 155, f. 1.—*B. & Br. Ann. N. H.*, No. 1760 *

“Perfect specimens of this interesting and little known species were received from Rev. J. Stevenson, confirming the opinion that it is a true *Inocybe*.”

Agaricus (Inocybe) Rennyi. *B. & Br.*

Small. Pileus hemispherical, fawn-color, centre brown; stem attenuated downwards, fibrillose; spores kidney-shaped, nucleate. *B. & Br. Ann. N. H.*, No. 1761.

On the ground. Hereford.

Spores .0005-.0007 inch.

Agaricus (Hebeloma) lugens. *Fr. Hym. Eur.*, 241.

Pileus fleshy, convex, then plane, smooth, rather viscid; stem solid, shining, fibrillose, striate, somewhat bulbous, at the top sprinkled with white meal; gills nearly free, fragile, crowded,

pallid, then ferruginous, edge crenulate, darker.—*B. & Br. Ann. N. H., No. 1762.*

Under beeches. Lyndhurst.

Odour pungent.

Agaricus (Hebeloma) capniocephalus. *Bull. t. 574, f. 2.*

Pileus fleshy, convex, then plane, obtuse, even, smooth, margin at length blackish; stem stuffed, attenuated downwards, striate with rufescent fibrils, becoming pallid; gills emarginate, broad, scarcely crowded, ferruginous.—*B. & Br. Ann. N. H., No. 1763.*

On the ground. Coed Coch.

Agaricus (Naucoria) badipes. *Fr. Hym. Eur., p. 259.*

Pileus somewhat membranaceous, campanulate, then convex, rather umbonate, smooth, pellucidly striate to the umbo when moist; stem stuffed, equal, rigid, ferruginous, squamulose to the middle, variegated with white fibrils; gills adnate, ventricose, rather distant, ferruginous grey.—*B. & Br. Ann. N. H., No. 1764.*

Abundant under larch. Coed Coch.

Agaricus (Crepidotus) calolepis. *Fr. Hym. Eur., 276.*

Pileus rather fleshy, dimidiate, seated on a villous nodule, marginate behind, variegated with minute crowded rufescent scales; gills concurrent at the base, at length ferruginous-brown.—*B. & Br. Ann. Nat. Hist., No. 1765.*

On sticks. Near Edinburgh.

Agaricus (Crepidotus) epibryus. *Fr. S. M., 275.*

White. Pileus membranaceous, resupinate, sessile, adnate above, silky, becoming smooth; gills concurrent in the centre, thin, crowded, whitish, then greyish flesh colour.—*B. & Br. Ann. N. H., No. 1766.*

On moss, grass, holly leaves, &c. Coed Coch; Shrewsbury.

Agaricus (Stropharia) Percevali. *B. & Br.*

Pileus slightly viscid, fleshy, umbonate, then flattened, ochraceous here and there, chiefly about the margin, whitish floccose; flocci soon disappearing; stem transversely squamose, hollow above, pallid; ring narrow, more or less persistent; gills distant, affixed, broad, white, then somewhat cinereous; at length pallid, umber. *B. & Br. Ann. N. H. No. 1767.*

On sawdust. Wallington. On rotten wood. Highgate, 1864.

“Pileus 2in., stem 2-3in., attenuated upwards $\frac{1}{3}$ - $\frac{1}{2}$ in. at base, $\frac{1}{4}$ in. above, gills $\frac{1}{2}$ in. wide. Flesh of pileus at length dull umber; stem umber within, rooting. Allied to *A. squamosus*, but distinct.”

Agaricus (Hypholoma) sublateritus var. **Schæfferi.** *Schæff., t. 49, f. 4, 5.*

Pileus conical, at length depressed, wrinkled; gills narrow, decurrent even in the youngest specimens. A remarkable variety.—*B. & Br. Ann. N. H., No. 1768.*

On trunks. Coed Coch.

Agaricus (Psilocybe) scobicola. *B. & Br.*

Pileus convex, umbilicate, white, smooth; stem fibrillose, nearly equal, or dilated at the apex, fistulose; gills broad, adnexed.—*B. & Br. Ann. N. H., No. 1769.*

On sawdust. Glamis, N.B.

Agaricus (Psilocybe) atrofus. *Schæff., t. 234.*

Pileus rather fleshy, hemispherical, convex, obtuse, smooth, slightly striate at the margin, discoloured when dry, even; stem hollow, thin, equal, pallid bay; gills rather decurrent, broad, plane, umber. *B. & Br., Ann. N. H., No. 1770.*

On the ground in woods. Glamis, N.B.

Agaricus (Psilocybe) hygrophilus. *Fr. Hym. Eur., 302.*

Pileus tawny, then clay colour; stem 4-6 inches long, rather fusiform, rooting; gills emarginate, with a deeply decurrent line; at length umber-brown.—*B. & Br. Ann. N. H., No. 1771.*

At the roots of ash. Glamis, N.B.

Hiatula Wynnæ. *B. & Br.*

White. Pileus tender, striate, pulverulent, darker in the centre; stem slender, striate; gills rather broad, rough. *B. & Br. Ann. N. H., No. 1772.*

In a stove at Kew.

"Pileus 1½ in. across; stem 1 in. high, 1 line thick. One specimen became darker in drying, and had a longer and thicker stem."

Bolbitius rivulosus. *B. & Br.*

Pileus campanulate, clay coloured, rivulose; stem attenuated upwards; gills narrow, cinnamon.—*B. & Br. Ann. N. H., No. 1773.*

On earth in an orchard house. Chiswick.

"Pileus about 1½ in. across. Very different from any other known species."

BRITISH SPECIES OF UROMYCES.

By M. C. COOKE.

It is now generally accepted that certain species of *Æcidium* are related to species of *Uromyces*, and are but conditions or stages of the same fungus. So many facts seem to indicate the soundness of this view that we are induced to rearrange the species of *Uromyces* found in Britain in accordance therewith. The only novelty to which we can establish any claim is the discovery, some years since, of the *Uromyces* on stems of the nettle to which *Æcidium Urticæ* is related. We have long delayed the publication in the hope of meeting with it again, since probably it has only been collected by ourselves and Dr. Capron, of Shere, but have not been successful. There is not, however, the slightest doubt of the accuracy or authenticity of the specimen from which the descrip-

tion has been drawn, and the fact is beyond dispute that an *Uromyces* is found, late in the year, after the *Æcidium* is gone, on the stems of the Nettle. We are not, however, prepared to accept the evidence as complete and satisfactory, for such species in which the *Æcidium* is said to be found on a foster plant of a different genus, and order, to that of the *Uromyces*.

In the following notes the continental method is adhered to of noting the three stages in the order of development, as—

- I. Hymenium, or *Æcidium*.
- II. Stylospores, or *Uredo*.
- III. Teleutospores, or *Uromyces*.

***Uromyces Ficariæ.* Lev.**

I. Hymenium. *Æcidium Ficariæ*, Pers. *Æ. ranunculacearum*, DC. in part.

II. Stylospores, unknown.

III. Teleutospores oval or elliptical, brown, scarcely thickened above, $\cdot 03 \times \cdot 018$ mm., on very short hyaline pedicels. *Uromyces Ficariæ*, Lev. Cke. "Hdbk," No. 1546.

On *Ranunculus ficaria*.

***Uromyces Behenis.* Lev.**

I. Hymenium. *Æcidium Behenis*, DC. Cke. "Hdbk," No. 1,622.

II. Stylospores globose, brown, brown, rough.

III. Teleutospores ovate or pyriform, brown, darker and thickened above, $\cdot 025\text{--}\cdot 03 \times \cdot 018\text{--}\cdot 02$, mm. ; pedicels hyaline, as long as the spores. *Uromyces Behenis*, Lev. Cke. "Micr. Fungi." (4th Ed.), No. 213.

On *Silene inflata*.

***Uromyces Geranii.* DC.**

I. Hymenium. *Æcidium Geranii*, DC. Cke. "Hdbk.," No. 1627.

II. Stylospores globose, smooth, $\cdot 025$ mm. diam. *Trichobasis Geranii*, B. Cke. "Hdbk.," No. 1589.

III. Teleutospores elliptical, purple brown, even, with a hyaline apiculus, $\cdot 03 \times \cdot 015$ mm., on very short evanescent pedicels. *Uromyces Geranii*, Cke. "Micr. Fungi." (4th), No. 213.

On leaves of *Geranium*.

***Uromyces Parnassiae.* Schrot.**

I. Hymenium. *Æcidium Parnassiae*, Grev. Cke. "Micr. F." (4th ed.), No. 198.

II. Stylospores spherical, rough, $\cdot 02\text{--}\cdot 025$, mm. *Uredo Parnassiae*, West.

III. Teleutospores ovoid, brown, even, $\cdot 025\text{--}\cdot 03 \times \cdot 02\text{--}\cdot 022$ mm. ; pedicels thin, hyaline. *Trichobasis Parnassiae*, Cke. "Hdbk.," No. 1591.

On *Parnassia palustris*.

***Uromyces Limonii.* Lev.**

I. Hymenium. *Æcidium Statices*, Desm., Cke. "Micr. Fun." (4th ed.), No. 197.

II. Stylospores subglobose, even, brown, $\cdot 028$ mm. diam. *Uredo Statices*, Desm., Cke. "Hdbk.," No. 1580.

III. Teleutospores ovate or pyriform, pale ochre, $\cdot 032\text{--}\cdot 04 \times \cdot 02\text{--}\cdot 025$, mm.; apex much thickened; pedicels thick, hyaline, as long as the spore. *Uromyces Limonii*, Lev. Cke. "Hdbk.," No. 1545.

On *Statice limonum*.

Uromyces appendiculatus. *Lev.*

I. Hymenium. *Æcidium Ervi*, Wallr.

II. Stylospores globose, brown, rough.

III. Teleutospores, ovate or subpyriform, very much thickened above, brown, $\cdot 02\text{--}\cdot 022 \times \cdot 015$ mm.; on long slender hyaline pedicels. *Uromyces appendiculata*, Cke. "Hdbk.," No. 1543.

On *Vicia sativa*, *Ervum hirsutum*, &c.

Uromyces phaseolorum. *De Bary.*

I. Hymenium. *Æcidium phaseolorum*, Wallr.

II. Stylospores subglobose, pale brown, rather rough, $\cdot 02\text{--}\cdot 025$ mm. diam.

III. Telentospores oval, apiculate, bright brown, $\cdot 03 \times \cdot 022$ mm.; epispore thick, even, pedicels as long as the spores. *Uromyces appendiculata*, Cke. "Hdbk.," No. 1543, in part.

On leaves of *Phaseolus*.

Uromyces Orobi. *Fekl.*

I. Hymenium. *Æcidium Orobi*, DC. Cke. "Hdbk.," No. 1623.

II. Stylospores subglobose, pale brown, $\cdot 022\text{--}\cdot 025 \times \cdot 02\text{--}\cdot 022$ mm.; slightly rough.

III. Teleutospores ovate or pyriform, bright brown, flattened above, $\cdot 03 \times \cdot 02$ mm.; epispore even, very much thickened above; pedicels as long as the spore, attenuated downwards. *Uromyces appendiculata*, Cke. "Hdbk.," No. 1543, in part.

On *Orobis tuberosus*.

Uromyces Fabæ. *Fekl.*

I. Hymenium. *Æcidium Viciæ*, Opiz(?)

II. Stylospores nearly spherical, tawny, $\cdot 022\text{--}\cdot 03 \times \cdot 02\text{--}\cdot 026$ mm. *Trichobasis Fabæ*, Lev.

III. Teleutospores ovoid, even, epiculate, brown, $\cdot 03\text{--}\cdot 04 \times \cdot 02\text{--}\cdot 026$ mm.; epispore much thickened at the apex, pedicels hyaline, long. *Puccinia Fabæ*, Link. Cke. "Hdbk.," No. 1512. *Uromyces Fabæ*, De Bary.

On *Faba vulgaris*.

Uromyces Pisi. *De Bary.*

I. Hymenium uncertain.

II. Stylospores sphaeroid or ovoid, yellowish, $\cdot 02\text{--}\cdot 024$ mm. *Uredo Pisi*, Strauss.

III. Telentospores ovoid, brown, $\cdot 026\text{--}\cdot 03 \times \cdot 02\text{--}\cdot 022$ mm.; epispore scarcely thickened above, everywhere minutely punctate; pedicels thin, hyaline, long. *Uromyces Pisi*, Fekl., S. M., 62. *Uromyces appendiculatus*, Cke. "Hdbk.," No. 1543, partly.

On *Pisum sativum*.

Uromyces apiculatus. *Lev.*I. Hymenium. *Æcidium Trifolii*, Cast.II. Stylospores almost spherical, pale brown. *Uredo Leguminosarum*, Rabh.III. Teleutospores elliptic, even, brown, soon deciduous, $\cdot 026\text{--}03 \times \cdot 02\text{--}023$ mm.; pedicels short, hyaline. *Uromyces apiculosa*, Cke. "Hdbk.," No. 1544 in part. *Uromyces Trifolii*, Fekl. "Sym. Myc.," p. 64.On Clover, *Lathyrus pratensis*, &c.*Uromyces Laburni*, Fekl., is probably also British, but of this we have at present no definite evidence.**Uromyces Alchemillæ.** *DC.*

I. Hymenium. Unknown.

II. Stylospores sphaeroid, yellowish, $\cdot 02$ mm. diam. *Uredo Alchemillæ*, Pers. *Uredo potentillarum*, DC. Cke. "Hdbk.," No. 1567.III. Telutospores ellipsoid, rather angular, brown, $\cdot 032\text{--}04 \times \cdot 33$ mm.; pedicel thick, short. *Uromyces intrusa*, Lev. Cke. "Hdbk.," No. 1547. *Trachyspora Alchemillæ*, Fekl., S. M. 65.On *Alchemilla*.**Uromyces scrophulariæ.** *Lib.*I. Hymenium *Æcidium Scrophulariæ*, DC. Cke. "Hdbk.," No. 1629.II. Stylospores (uncertain). *Uredo scrophulariæ*, Lasch.III. Teleutospores elliptical, brown, even, $\cdot 0022\text{--}03 \times \cdot 012\text{--}015$ mm. on long, slender hyaline pedicels. *Puccinia scrophulariæ*, Lib., Cke. "Hdbk.," No. 1476. *Uromyces scrophulariæ*, Cke. "Micr. Fung." (4th ed.), 213. *Uromyces concomitans*, B. & Br., Cke. "Micr. Fung." (4th ed.), 213.On *Scrophulariæ*.**Uromyces rumicum.** *Lev.*I. Hymenium. *Æcidium rubellum*, Cke. "Hdbk.," No. 1632. Var. β .II. Stylospores sphaeroid, rough, pale-brown, $\cdot 026\text{--}028 \times \cdot 02\text{--}026$ mm. *Trichobasis rumicis*.III. Teleutospores oval, warted above, brown, $\cdot 026\text{--}03 \times \cdot 026\text{--}028$ mm.; very deciduous. *Uromyces rumicum*, Fekl. "S. M.," p. 64. *Uromyces apiculatus*, Cke. "Hdbk.," No. 1544, in part.On species of *Rumex*.**Uromyces aviculariæ.** *Schröt.*I. Hymenium. *Æcidium aviculariæ*, Kze., Cke. "Micr. Fungi" (4th ed.), 199.II. Stylospores nearly spherical, yellow-brown, $\cdot 02\text{--}025 \times \cdot 02$ mm. *Uredo Polygoni aviculariæ*, A. & S. "Consp.," 127.III. Teleutospores ovoid, brown, even, $\cdot 025\text{--}026 \times \cdot 022$ mm.; pedicels hyaline, longer than the spore. *Uromyces polygoni*, Fekl. "S. M.," 64. *Capitularia polygoni*, Rabh. "Bot. Zeit.," 1851. *Puccinia vaginalium*, Cke. "Hdbk.," No. 1469.On *Polygonum aviculare*.

Uromyces betæ. *Kuhn.*

I. Hymenium. *Æcidium betæ*, Kuhn.

II. Stylospores subglobose, brown, smooth, $\cdot 02\text{--}\cdot 022$ mm. *Uredo betæ*, Pers. *Trichobasis betæ*, Cke. "Hdbk.," No. 1587.

III. Teleutospores ovate or pyriform, pale-brown, with a slight apiculus, $\cdot 025\text{--}\cdot 03 \times \cdot 02\text{--}\cdot 025$ mm.; on slender pedicels. *Uromyces betæ*, in Fekl. "S. M.," p. 64.

On leaves of beet.

Uromyces salicorniæ. *Lev.*

I. Hymenium. *Æcidium salicorniæ*, DC.

II. Stylospores oval, or nearly globose, very pale, $\cdot 02\text{--}\cdot 022 \times \cdot 018\text{--}\cdot 02$ mm.; epispore thin.

III. Teleutospores oval, pale-brown, $\cdot 03\text{--}\cdot 022$ mm.; epispore even, thickened at the apex, pedicels scarcely as long as the spore, thick, hyaline. *Uromyces salicorniæ*, Lev.

On *Salicornia*.

Uromyces sparsa. *Lev.*

I. Hymenium uncertain.

II. Stylospores oval, pale, smooth, $\cdot 025 \times \cdot 02$ mm.

III. Teleutospores oval, pale-brown, $\cdot 032\text{--}\cdot 035 \times \cdot 022\text{--}\cdot 025$ mm.; epispore smooth, much thickened above; pedicels as long as the spores, thick, hyaline. *Uromyces sparsa*, Lev. Cke. "Hdbk.," No. 1550.

On *Spergularia rubra*.

Uromyces valerianæ. *Fekl.*

I. Hymenium. *Æcidium valerianacearum*, Duby. Cke. "Hdbk.," No. 1618.

II. Stylospores subglobose, pale-brown, smooth, $\cdot 015\text{--}\cdot 02$ mm., or slightly longer. *Uredo valerianæ*, DC.

III. Teleutospores elliptical, pale-brown, even, $\cdot 022\text{--}\cdot 03 \times \cdot 012\text{--}\cdot 015$ mm.; on short evanescent pedicels. *Uromyces valerianæ*, Fekl. "Sym. Myc.," 63. *Lecythea valerianæ*, B. Cke. "Hdbk.," No. 4595.

On valerian.

Uromyces urticæ. *Cke.*

I. Hymenium. *Æcidium urticæ*, DC. Cke. "Hdbk.," No. 1621.

II. Stylospores. Not seen.

III. Teleutospores subpyriform, apiculate, pale, $\cdot 03 \times \cdot 018$ mm. On persistent hyaline pedicels; epispore thickened at the apex. (Shere, Surrey.)

On nettles. III. Very rare.

Uromyces scutellatus. *Lev.*

I. Hymenium. *Æcidium Euphorbia cyparissia*, DC.

II. Stylospores not determined.

III. Teleutospores subglobose or elliptical, pale-brown, $\cdot 022\text{--}\cdot 03 \times \cdot 016\text{--}\cdot 02$ mm.; epispore thin, coarsely warted; pedicels short, hyaline, evanescent. *Uredo scutellata*, Pers. "Syn.," p. 220.

On wood spurge.

Uromyces excavatus. DC.

I. Hymenium. *Æcidium Euphorbiæ*, Pers. Cke. "Hdbk.," No. 1610, in part.

II. Stylospores subglobose, pale-brown, $\cdot 018\text{--}\cdot 02$ mm.; episporium granulated.

III. Teleutospores oval, bright-brown, $\cdot 028\text{--}\cdot 03 \times \cdot 018\text{--}\cdot 02$; episporium smooth or faintly striate, scarcely thickened above; on short evanescent pedicels. *Uromyces excavata*, DC. Cke. "Micr. Fun." (4th ed.), 213.

On species of *Euphorbia*.

There is usually some confusion and uncertainty amongst authors concerning these two species of *Uromyces* on *Euphorbia*. Having original specimens in our Herbarium from Persoon and DeCandolle, we are enabled to determine for certainty the species which each of these authors had in view. Persoon's species (*U. scutellata*), has pale teleutospores, which are very coarsely warted, whilst in DeCandolle's species (*U. excavata*), the teleutospores are dark-coloured, with a smooth episporium, or with scarcely distinguishable striae. On the small *Euphorbia exigua*, if we mistake not, an *Uromyces* occurs which cannot be referred to either of these species, and which is perhaps the *U. tuberculatus* of Fuckel.

Uromyces alliorum. DC.

I. Hymenium uncertain.

II. Stylospores subglobose, pale, $\cdot 022 \times \cdot 025$ mm.; episporium thin. *Uredo alliorum*, DC. Cke. "Hdbk.," No. 1579.

III. Teleutospores elliptical, brown, $\cdot 03\text{--}\cdot 035 \times \cdot 015\text{--}\cdot 018$ mm.; pedicels very evanescent. *Uromyces alliorum*, Cke. "Hdbk.," No. 1542.

On species of *Allium*.

Uromyces ornithogali. Lev.

I. Hymenium. *Æcidium ornithogali*, Kze.

II. Stylospores, at present unknown.

III. Teleutospores, ovate, fuliginous, brown, with a small hyaline apiculus, $\cdot 03 \times \cdot 02$; on short hyaline pedicels. *Uredo ornithogali*, Kze. & Schm.

On *Gagea lutea*. (Yorkshire).

Uromyces concentricus. Lev.

I. Hymenium. *Æcidium scillæ*, Fekl.

II. Stylospores globose, reddish-brown, mixed with the teleutospores.

III. Teleutospores ovate, dull-brown, $\cdot 02\text{--}\cdot 025 \times \cdot 02$ mm.; episporium smooth, thickened a little above; pedicels longer than the spore, slender, hyaline. *Uromyces concentricus*, Lev. Cke. "Hdbk.," No. 1548. Fekl. "Sym. Myc.," p. 65.

On wild hyacinth.

Uromyces graminum. Cke.

I. Hymenium unknown.

II. Stylospores globose, pale, scarcely coloured, rough, $\cdot 02\text{--}\cdot 022$ mm.

III. Teleutospores ovate, bright-brown, quite smooth, $\cdot 015\text{--}\cdot 02 \times \cdot 012$ mm.; epispore thickened and darker above; pedicels short, slender, hyaline. *Uromyces graminum*, Cke. "Hdbk.," No. 1551.

On *Dactylis glomerata*.

Uromyces junci. Tul.

I. Hymenium. *Æcidium* unknown.

II. Stylospores globose or oval, brown, rough, $\cdot 018\text{--}\cdot 02 \times \cdot 016\text{--}\cdot 018$ mm. *Uredo junci*, Strauss.

III. Telentospores pyriform, clavate, compressed laterally and irregular, bright-brown, $\cdot 03\text{--}\cdot 035 \times \cdot 015\text{--}\cdot 02$ mm.; epispore smooth, very much thickened and darker above; pedicels thick, continuous, persistent. *Uromyces junci*, Tul. Cke. "Micro. Fun." (4th ed.), 213. *Puccinella junci*, Fckl.

On rushes.

Besides the foregoing, there are other species of *Uromyces* found in Europe, some of which will probably be met with in Britain. Whether all of these are good and distinct species, we are not prepared to affirm, but some of them undoubtedly are. Amongst those to be sought after are *U. calystegiae*, DeBary; *U. laburni*, DC.; *U. muscari*, DC.; *U. liliacearum*, Kze., and the forms on *Lathyrus*, *Medicago*, *Onobrychis*, *Hedysarum*, and other *Leguminosae*.

ALGÆ EXSICCATÆ AMERICÆ BOREALIS.

CURANTIBUS—W. G. FARLOW, C. L. ANDERSON, D. C. EATON.

FASC. III.

Here follows a list of the species included in the last fasciculus:—

101. *Sargassum vulgare*, Ag.
102. *Sargassum piluliferum*, Ag.
103. *Sargassum Agardhianum*, Farlow.
104. *Sargassum pteropleuron*, Grunow.
105. *Sargassum bacciferum*, Ag.
106. *Halidrys osmundacea*, Harv.
107. *Fucus evanescens*, Ag.
108. *Fucus furcatus*, Ag.
109. *Fucus vesiculosus*, Linn.
- 109bis. *Fucus vesiculosus*, L., var *spiralis*, Lyngb.
110. *Fucus* (*Pelvetia*) *fastigiatus*, Ag.
111. *Egregia Menziesii* (Turn.), Aresch.
112. *Agarum Turneri*, Post. & Rupr.
113. *Postelsia palmaeformis*, Rupr.

114. *Pterygophora Californica*, Rupr.
115. *Dictyoneuron Californicum*, Rupr.
116. *Nereocystis Lütkeana*, Post. & Rupr.
117. *Laminaria longierucis*, De la Pyl.
118. *Laminaria Sinclairi* (Harv.).
119. *Laminaria flexicaulis*, Le Joh.
120. *Saccorhiza dermatodea* (De la Pyl.), Ag.
121. *Desmarestia latifrons*, Kütz.
122. *Gigartina Radula*, Ag.
123. *Gigartina microphylla*, Harv.
124. *Gigartina spinosa* (Kütz), Harv.
125. *Iridaea laminarioides*. Bory.
126. *Callophyllis variegata* (Bory), Kütz.
127. *Callophyllis furcata*, Farlow.
128. *Callophyllis laciniata*, Kütz.
129. *Callophyllis gracilarioides*, Farlow.
130. *Grateloupia Cutleriæ*, Kütz.

A NEW BRITISH PEZIZA.

By W. PHILLIPS, F.L.S.

To British Botanists every addition to the Flora of this country has a great interest, which to some extent arises from the surprise at finding that anything has been overlooked within an area so limited in which so many sharp eyes are at work, but perhaps more to the pleasure we feel in having so rich a Flora in our own native land. The minute species which I have the pleasure of describing does not appear, as far as I have been able to learn, to have been previously noticed, though, probably, not uncommon. It may be distinguished thus:—

Peziza asterostoma, n. s.—Minute, scattered, sessile, globose, white, mouth constricted, and surrounded by long, radiating, deflexed, simple hairs; exterior glabrous, very rarely with a few scattered hairs; asci clavato-cylindrical; sporidia 8, oblong or fusiform ($\cdot 007 \times \cdot 0015$ mm.) ; paraphyses filiform.

On dead herbaceous stems, *Alliaria officinalis*, &c. April, 1879. Broome, Shropshire.

The cups are not more than $\cdot 2$ mm. in diameter, and occurred in company with *Peziza sulphurea*, Pers. The hairs, which consist of a single cell, are about $\cdot 07$ mm. long, and are confined chiefly to the margin, forming a horizontal fringe, but occasionally a few are distributed over the exterior of the cup.

This species will stand in the section *Dasyascyphæ*, in the sessile group. Specimens will be published in my next fasciculus of *Elvellacei Britannici*.

ADDITIONS TO THE BRITISH *RAMALINEI*.

By the REV. J. M. CROMBIE, F.L.S.

Since my "Notes on the British *Ramalinae* in Herb. Brit. Mus., in "Journ. Bot.," 1872, pp. 70-5, several interesting species and varieties have been detected in different parts of the country, which I here enumerate. At the same time one or two corrections require to be made on those there recorded, and subsequently described in Leighton's "Lich. Fl. Suppl.," pp. 470-7.

1. ***R. farinacea* f. *phalerata*.** *Ach.*

Probably not unfrequent in S. England, though we have seen it only from Stowe Park, Buckingham. Sterile..

2. ***R. fraxinea* var. *ampliata* f. *monophylla*.** *Cromb.*

Thallus simple, very broad, oblongo-rotundate, subreticulately costato-rugose.

On old trunks. New Forest. Fertile.

Analagous to f. *monophylla*, Cromb., of *R. evernioides*.

3. ***R. fastigiata* f. *minutula*.** (*Ach.*)

On old fir pales. Sterile. Probably not rare, as in the New Forest and various parts of Scotland.

This was referred by Acharius to *R. farinacea*, but more correctly by Fries fil., in "Lich. Scand.," I., p. 37, to *R. fastigiata*. It is mentioned in my "Not. Brit. Ram.," p. 7, as a caespitose condition of *R. calicaris*.

4. ****R. capitata*.** *Ach., Nyl.*

On mountain rocks. Very rare. Teesdale, Durham; Ben-nahoord, Bracmar.

I may here mention that true *R. polymorpha* is an extremely rare British plant, as also its var. *emplexa*, *Ach.*

5. ***R. scopulorum* f. *incrassata*.** *Nyl.*

On maritime rocks. Jersey and Cornwall. Probably frequent on the rocky coasts of Britain.

6. ***R. cuspidata* f. *crassa*.** (*Del.*)

On maritime rocks. Jersey, Cornwall, and Portlethen, Kincardineshire.

F. minor, *Nyl.*, North Wales and Coast of Kincardineshire. Probably common.

7. ****R. breviuscula*.** *Nyl.*

On maritime and mountain rocks. S. and W. England, N.E. Scotland.

This is *R. polymorpha*, "Mudd. Man.," p. 74, "Cromb. Enum.," p. 25, pro p., Leight. "Lich. Fl.," p. 92. It is also *R. polymorpha* f. *depressa*, Cromb., in "Journ. Bot.," 1872, p. 72.

F. gracilescens. *Cromb.*

Thallus very small, pulvinato-congested, laciniae slender, the apices incurved or revolute.

On maritime boulders. Apparently very rare in S. England.

8. **R. Curnowii.** *Cromb.*

On maritime rocks. S.W. England.

As observed by Nylander, in "Flora," 1877, p. 562, this descends from *R. cuspidata*.

9. **R. geniculata.** *Tayl.*

On thorns. Killery Bay, Connemara.

This is a very interesting discovery by Mr. Larbalestier of a plant formerly known to occur only in exotic regions.

10. **R. minuscula.** *Nyl.*

On the branches of stunted larches. Craig Cluny, Braemar, and probably also elsewhere in that district.

11. **R. intermedia.** (*Del.*)

On stems of heath and shrubs. Scilly Islands and Galway, &c. Sparingly fertile.

NOTE ON **Lecidea farinaria.** *Borr.*

In "Sm. E. B." Suppl. II., t. 2, 727, Mr. Borrer described a plant under the above name, which has hitherto not been identified by any subsequent lichenist. Schærer, in his "Enum.," p. 138, doubtfully refers it to *Lecidea granulosa* var. *aporetica*, Ach. Of this latter there is no specimen amongst the Lichens sent by Acharius to the Linnean Society, nor *fide* Fries fil. (Lich. "Scand.," p. 443) are there any in his own Herb. now in the University of Helsingfors. I believe, however, that it is merely a corticole and lignicole state of *Lecidea decolorans*, such as I have gathered on Craig Calliach, &c. (not var. *aporetica*, Cromb., Exs. n. 81, which is *Lecidea viridescens*, Schrad.). Unfortunately, also, there is no named specimen of *Lecidea farinaria* in Hb. Sowerby. A specimen, however, from Borrer himself occurs in Hb. Salwey, which in appearance exactly corresponds with the figure and description in E. B. S., and with an unnamed specimen in Hb. Sowerby. There can thus be no doubt as to the identity of this previously most uncertain species. It is also the plant named by Nylander *Lecanora homopis*, Nyl. = Cromb. Exs. n. 163, which is, therefore, with strict propriety to be called *Lecanora farinaria* (Borr.). It is very common on old pales in the north of Middlesex and south of Hertfordshire, though often sterile.

J. M. C.

NOTE ON **Bacidia Arnoldiana.** *Körb.*

In Körber "Par. Lich." II. (1860), p. 134, a well-marked species of *Lecidea* is described under the above name, in compliment to the distinguished Lichenist, Dr. Arnold. Previously to this however, Krempelhuber, in "Flora," 1855, p. 72, had described another species, s.n. *Biatorina Arnoldi*, Kphb. As in the Nylan-

derian arrangement, the two genera of the Sporologists, *Bacidia* and *Biatorina*, rightly constitute merely sections of the genus *Lecidea*, and as the two specific names *Arnoldiana* and *Arnoldi* are in reality homonymous, it becomes necessary to re-name the former of these species. I therefore propose to call it *LECIDEA LARBALESTIERI*, Cromb., in compliment to Mr. Larbalestier, who by his extensive researches has added so many interesting species to the genus *Lecidea*. I may also observe that though *Lecidea Larbalestieri* has not yet been recorded as detected in this country, there is every reason to believe that it will yet be found; and, indeed, some of our specimens of *Lecidea inundata* (Fr.), with which it is apt to be confounded, may, on re-examination, be seen to be referable to this species.

J. M. C.

OBSERVATIONS ON *MICROGONIDIA*.

By the REV. J. M. CROMBIE, F.L.S.

At one time even Schwendener himself discovered and taught that the gonidia of Lichens had their origin in the hyphæ, though afterwards, no doubt, on finding out his fancied error, he surrendered this opinion, and inculcated the now notorious Schwendenerian hypothesis.

At a later date, Fries fil. accepted the said discovery and promulgated it very truthfully in "*Lich. Scand.*," p. 7, where he writes as follows:—"Depending on my own observations, I embrace and defend this opinion"—viz., that the gonidia have their origin from the hyphæ. "For the hyphæ are not only elongated into filaments, but also send out short ramules. The terminal cell of the ramule is gradually dilated; it becomes subglobose and at length is filled with chlorophyll (or a sub-similar substance); in a few that cell is changed into a gonidium, which finally is divided in various ways, and gives origin to other gonidia." These observations of the distinguished author are thus affirmed to be in accordance with nature, and teach that the gonidia have their origin in the simple, globulose terminal dilatation of the ramules of the hyphæ. This dilated portion is filled with green matter, and eventually is separated from the filament, and so becomes a free gonidium. Such is the extremely simple history of the origin of gonidia in Lichens according to Fries fil.

It would now, however, appear that these observations have not been correctly made. For Dr. Minks has recently come forward with other and new observations concerning the origin of the gonidia in the hyphæ, which are entirely different to those recorded by Schwendener and Fries fil. In a paper in the "*Flora*," 1878, Nos. 15-18, entitled "*Das Microgonidium*," he states that he has

perceived (and in this he is corroborated by Dr. Müller, of Geneva, in "Archives des Sciences Physiques et Naturelles," 1879, No. 1),* that the commencement of the gonidia takes place in the hyphæ and in various other anatomical hyphoid elements. Nay, he has even seen, according to his own account, initial gonidia, called by him "Microgonidia" in the rhizinae, in the cortical cells, in the medullary filaments, in the young thecae, in the spores, &c., so that they are common both to the vegetative and the reproductive organs of Lichens. In all of these, as well as in the hyphæ, they appear, according to Dr. Minks, in the form of very minute corpuscles, which in the hyphæ become free through the dissolution† of these, and there, as elsewhere, gradually become larger, and at length assume the definite form of gonidia. Such expressed, in a very few words, is the history of Dr. Minks' "Microgonidia," or the minute corpuscles which, according to him and Dr. Müller, are in their evolution changed into gonidia, and constitute the initial state of gonidia.

With reference to these so-called "Microgonidia," Dr. Nylander (who in his numerous writings has done more than any other Botanist to prove how untenable is the Schwendenerian doctrine in all its phases) has just declared in the "Flora" (*Addend.* xxxi) that they are no new discovery whatever, and have nothing at all in common with gonidia. In fact, they are simply what is called in Vegetable Anatomy "molecular granulations," which never, if present in the cellules, go forth from them, and never present any cellulose metamorphosis. So far from being any novelty, their existence has been well known to every microscopic observer; and vainly in these granulations shall we seek for anything having any special relation to gonidia or their origin.

In this view I do not hesitate to affirm that every competent observer entirely coincides. Consequently "the labours of Dr. Minks" cannot in any way, in so far, at least, as his discovery of "Microgonidia" is concerned, be regarded as "profoundly modifying the anatomical notions which were entertained concerning the thallus of Lichens." Rather is it to be regretted in the interest of true science and for the final suppression of Schwendenerian opinions that these labours, valuable in some respects as they may be, should have resulted in the promulgation of another theory as untenable as that which Dr. Minks set himself to destroy.

I may here also briefly take notice of the "zoospores or zoosporoid corpuscles," which Dr. Müller (l.c.) mentions as having been observed by him in certain gonidia "contento contracto,"

* See also the translation of M. Roumeguere's paper in last No. of "Grevillea," pp. 89-92.

† This liberation of the corpuscles and dissolution of the hyphæ they certainly have not seen, though they are certain that the matter is thus effected. It exists, therefore, merely in their own fancy, and imagination has no place whatever in true science.

gyrosely agitated (and also in the spores of *Agaricus rimosus*). This is a discovery exactly of the same nature as that of *Microgonidia*; and they are in reality nothing more than the same "molecular granulations." The motion which he saw is evidently merely the well-known *Brownian movement**—an ordinary property of molecular granulations to agitate themselves where sufficient space is allowed them. This is an elementary and well-known matter.

PREPARATIONS OF LICHENS FOR THE MICROSCOPE.

Mr. W. Joshua, of Cirencester, has prepared a series of 48 slides, illustrating the genera and species of British Lichens. These are but the first issue of what is intended to be a complete collection, as far as possible, of typical forms. The price of the set is three pounds, which contains the following species:—

No.	TRIBE.	FASCICULUS 1.
1	Lichenei.	<i>Gonionema velutinum</i> .— <i>Nyl.</i>
2	"	<i>Ephebe pubescens</i> .— <i>Fr.</i>
3	"	<i>Lichina pygmæa</i> .— <i>Ag.</i>
*4	Collemei.	<i>Pyrenopsis granatina</i> .— <i>Smft.</i>
*5	"	<i>Collemopsis Arnoldiana</i> .— <i>Nyl.</i>
6	"	<i>Synalissa symphorea</i> .— <i>D.C.</i>
*7	"	<i>Collema myriococcum</i> .— <i>Nyl.</i>
8	"	" <i>pulposum</i> .— <i>Bernh.</i>
9	"	" <i>multipartitum</i> .— <i>Sm.</i>
10	"	" <i>nigrescens</i> .— <i>Huds.</i>
*11	"	" <i>aggregatum</i> .— <i>Ach.</i>
12	"	" <i>biatorinum</i> .— <i>Nyl.</i>
13	"	<i>Leptogium plicatile</i> .— <i>Ach.</i>
14	"	" <i>Burgessii</i> .— <i>Lghft.</i>
15	"	" <i>muscicolum</i> .— <i>Sw.</i>
16	"	" <i>Schraderi</i> .— <i>Bernh.</i>
17	Myriangiei.	<i>Myriangium Duriæi</i> .— <i>Mnt. & B.</i>
*18	Caliciei.	<i>Calicium septatum</i> .— <i>Leight.</i>
*19	"	<i>Trachylia tigillaris</i> .— <i>Fr.</i>
20	Stictei.	<i>Ricasolia glomulifera</i> .— <i>Lightft.</i>
21	Peltigerei.	<i>Peltigera venosa</i> .— <i>L.</i>
22	"	" <i>horizontalis</i> .— <i>L.</i>
*23	"	<i>Solorina bispora</i> .— <i>Smft.</i>
24	"	" <i>crocea</i> .— <i>L.</i>
25	Physciei.	<i>Physcia pusilla</i> .— <i>Arn.</i>
26	"	" <i>ciliaris</i> .— <i>L.</i>
27	Pertusariei.	<i>Pertusaria globulifera</i> .— <i>Turn.</i>

* *Vid.* "Lindsay Popular History of British Lichens," pp. 71, 292, and *Nyl.* in "Flora," l. c.

No.	TRIBE.	FASCICULUS.
28	Lecanorei.	Lecanora Bischoffii.— <i>Hepp.</i>
29	"	Phlyctis argena.— <i>Ach.</i>
30	Thelotremai.	Thelotrema lepadinum.— <i>Ach.</i>
31	Lecidinei.	Lecidea alocizoides.— <i>Leight.</i>
*32	"	urceolata.— <i>Crom.</i>
*33	"	leiotea.— <i>Nyl.</i>
*34	"	Næglii.— <i>Nyl.</i>
35	"	sanguinaria.— <i>L.</i>
36	"	Zwackhii.— <i>Mass.</i>
37	"	pachycarpa.— <i>Duf.</i>
*38	"	Odontotrema longius.— <i>Nyl.</i>
39	Graphidei.	Graphis Ruiziana.— <i>Fu.</i>
*40	"	Arthonia proximella.— <i>Leight.</i>
41	"	ilicina.— <i>Nyl.</i>
*42	Pyrenocarpei.	Verrucaria fusco-argillacea.— <i>Anzi.</i>
43	"	nitida.— <i>Weig.</i>
44	"	olivacea.— <i>Bow.</i>
45	"	cinerea.— <i>Pers.</i>
46	"	Verrucarina sparsula.— <i>Nyl.</i>
*47	Peridiei.	Endococcus complanata.— <i>Nyl.</i>
*48	"	Mycoporum ptæleodes.— <i>Nyl.</i>

To Museums or Private Collectors, these specimens will prove invaluable as an easy means of reference and comparison. To the Science Student they offer the advantage of a quick and easy method of familiarizing the eye with the appearance of the structure of thallus and apothecia, and of the different groups of Lichens, gonidia, paraphyses, asci, spores, epithecium, hypothecium, and thalamium being all represented.

To the Amateur and those just beginning the study, the examination of these specimens will give a better idea of the various terms used in describing the shape and size of spores than is possible by any written explanation; at a glance, the meaning of such terms as large, small, moderate, or minute spores, and ovoid, oblong, fusiform, cylindrical, ellipsoid, polari-bilocular, septate, muriform, etc., may be perceived.

The species marked with an asterisk are either very rare or only recently discovered in Britain.

LICHENS OF IRELAND.

Mr. C. Larbalestier, B.A., proposes to issue, during the present year, Fasciculi of the Lichens of Ireland, England, and the Channel Islands, under the title of "Larbalestier's Lichen Herbarium." The series will include a large number of plants which are altogether new to Science, or little known to the majority of British Lichenists. All communications to be addressed to the author, Roche Vue, St. Aubin's, Jersey.

THE UROMYCES OF EUPHORBIA.

By P. MAGNUS.*

Professor Körnicke, in No. 3 of "Hedwigia" for 1877, refers the Uromyces growing on *Euphorbia Gerardiana* and *Euphorbia verrucosa*—and, according to him, also on *Euph. Cyparissias*—to a new species (*Uromyces lævis*, Körn.), which he distinguishes from *Uromyces scutellatus*, Lév., by the smooth membrane of the Telentospores. At the meeting of the Association of Naturalists on the 20th March, 1877, I endeavoured to prove that this Uromyces corresponds with the old *Uredo excavata*, DC., and it seems advisable to me to give here my arguments for the benefit of the readers of "Hedwigia."

On our ordinary *Euphorbiaceæ*, *Tithymalus Cyparissias* and *Tithymalus Esula* grow a Uromyces and a *Æcidium*, both of which originate the same degeneration of the vegetative powers attacked by them, and both grow on them in the same characteristic manner; while their Mycelium pervades the whole of the attacked vegetative system, and their Spermogonia and Telentospora stroma, or *Æcidium* cups, are spread over the whole expanse of all the leaves of the attacked vegetation, or of the affected part. All fungologists (myself included) had hitherto assumed—principally from analogy—that both these fungi, the Uromyces and the *Æcidium*, in the circle of evolution belonging to one Fungus, were different fructifications of one and the same fungus. So surprising were the observations of Chief Staff Surgeon Dr. Schroeter that the spores of *Æcidium Euphorbiæ* when sown on the leaves of our Pea, *Pisum sativum*, L., sprouted there as Stylospore pustules of *Uromyces Pisi*, Strauss. ("Hedwigia" xiv., part 1875, p. 98). It is correct that an *Æcidium* never grows on *Pisum sativum*, L. But, nevertheless, I had hitherto imagined that *Uromyces Pisi* belonged to an Uromyces which was only unable to attain to the formation of the *Æcidium* fructification on the special foster plant, *Pisum sativum*, L.; while it grows in all its forms of fructification on the nearly allied tares, *Vicia angustifolia*, Rth., *Lathyrus montanus*, Bernh., &c. On these grow a very closely allied and long-stalked Uromyces, which Schroeter denotes *Uromyces Viciæ Fabæ* (Pers.), and distinguishes from that which grows on the *Pisum* by the great thickening of the apex of the Telentospores. That a parasitical fungus does not develop all its fructifications on certain allied plants, is frequently the case. Thus, the *Puccinia Compositarum*, Schl., produces on the *Taraxacum officinale* all its forms of fructification, but it never produces *Æcidium* on *Hieracium Pilosella*; and thus, in an analogous manner, *Cystopus candidus*, Pers., grows on very many *Cruciferaæ*, but forms Oogoniæ on very few species. Therefore, the above-mentioned observations of Dr. Schroeter surprise me in many respects.

* Translated from "Hedwigia" for May, 1877.

I read with very great interest Prof. W. Voss's communications in the "Austrian Botanical Journal" for 1876, No. 9, p. 299, that he, in the Laibach State Forest, found *Euphorbia verrucosa* largely covered with *Æcidium*, and that between the *Æcidium* cups at the end of May the stroma of Teleutospores of *U. scutellatus* (Pers.), Lév., appeared. Professor W. Voss, at my request, most kindly sent me the specimens which were laid before the Society of Naturalists at their March meeting this year.

In the examples sent, the *Æcidium* cups and *Uromyces* grow in closely the same characteristic manner as on *Euphorbia Cyparissias*, so that one is very much inclined to consider both to be the same species. On the stalk which bears both forms of fructification, the *Uromyces* stroma grows between the *Æcidium* cups; on the other stalk there are exclusively *Uromyces*. This common successive growing of the *Æcidium* cups and *Uromyces* stroma on one stem, as observed by Voss, makes it very probable that both these forms of fructification belong to one circle of evolution. While, therefore, the *Æcidium* cups and *Uromyces* stroma treated of above on *Euphorbia verrucosa* accord closely in their appearance with those on *Euph. Cyparissias*, yet the Teleutospore itself shows a difference, so that on that account we may consider the *Uromyces* on *Euph. verrucosa* as specifically different from *Urom. scutellatus*, Lév., on *Euph. Cyparissias*. That is to say, the Teleutospores of the latter have strong projecting, short fillet-formed, irregularly placed thickenings on the epispore, while the Teleutospores on *Euph. verrucosa* are quite smooth. Herein they agree with the *Uromyces* which grows on *Euphorbia Gerardiana*, which also attacks its closely allied plants in the same way as *Uromyces scutellatus*, Lév. I had not, in truth, hitherto been able to observe with certainty an *Æcidium* on *Euph. Gerardiana*; yet certainly, Fuckel, in "Symbolæ Mycologicae," p. 64, gives the appearance of an *Æcidium* on *Euph. Gerardiana*, and Dr. Schroeter communicates to me by letter that he has observed an *Æcidium* on *Euph. Gerardiana* at Rheinufer, and this, also, Körnicke reports in the above-mentioned communication, and Oudemans even shows in "Aanwinsten voor de Flora Mycologica van Nederland" (3^e Bijlage tot de 30^e Jaarvergadering der Nederl. Bot. Vereniging), p. 8, that *Uromyces scutellatus*, Lév., *Fungus hymeniferus* and *teleutosporiferus* grow near Antem on *Euphorbia Gerardiana*.

One asks oneself now how the *Uromyces*, with smooth-membraned teleutospores, which grow on *Euphorbia verrucosa* and *E. Gerardiana*, is to be characterised. In Duby "Botanicon gallicum," p. 11., fig. 896, there are three distinct species of *Uredo* on different Euphorbiaceæ. The one is the *Uromyces proeminens*, Pass., on *Euphorbia Chamæsyce*, which Saccardo recently in "Hedwigia," 1875, p. 192, has unnecessarily newly advanced and described as *Uromyces Chamæsyce*, Sacc. In addition there are described *Uredo scutellatus*, Pers., "In Euphorbiis variis præsertim in *E. Cyparissia*, cujus folia inde deformantur," and *Uredo excarata*, DC., "ad Euphorbias varias præsertim in provinciis australibus."

As the latter species I long ago claimed *Uromyces tuberculatus*, Fekl., which Fuckel, in "Symbol. Mycol.," p. 64, had combined with *Uromyces scutellatus*; while this fungus is mentioned in "Grevillea," No. 23, May, 1874, p. 161, under the supplement to the English Fungoflora, as *Uromyces excavata* (DC.), on *Euphorbia exigua*. But after Dr. Schroeter had, at my request, most kindly forwarded this fungus to me, I was able easily to convince myself that its appearance on *Euph. exigua* is quite different to that described by Duby i.e. as *Uromyces excavatus* (DC.), for *Uromyces tuberculatus* grows only in a small and completely separate heap on the leaves and more abundantly on the stalk of *Euphorbia exigua*, so that the separate attacked leaves, as also the stalk, bear only a few scattered heaps, and the greater part of the attacked leaf, as also the whole of the attacked plant, is entirely free from fungus. On the contrary, Duby i.e., in his description of *Uromyces excavata*, DC., calls it "*hypophylla, acervulis fuscis parvulis, numerosis*," &c., and in conclusion it is remarked, "*Acervuli frequentes totam paginam occupant, sed non deformant*." This cannot, therefore, be the *Uromyces tuberculatus*, Fekl., which grows in separate little heaps on the stalk and leaf of *Euphorbia exigua*. Whereas the description very well suits the *Uromyces* which grows on *Euph. Gerardiana* and *Euph. verrucosa*, in both of which species, indeed, the leaves attacked by the fungus do not present so very different an appearance from that of the normal leaves, as the leaves of *Euph. Cyparissias* do when attacked by the *Uromyces*. The *Uromyces* growing on *Euph. verrucosa* and *Euph. Gerardiana*, I, therefore, hold to be the old *Uredo excavata*, DC., and describe it as *Uromyces excavata* (DC). It is distinguished from *Uromyces scutellatus*, Lév. (with which, in its characteristic growth on Euphorbiaceæ, it fully agrees), by the smooth membrane of the Teleutospores, as also by its association with the *Æcidium*.

We have here consequently a most highly paradoxical circumstance of two very nearly allied species of *Uromyces* growing on the most nearly related Host plants. Both grow in nearly the same very characteristic manner on the Host plants, and are accompanied by the same undistinguishable *Spermogonia*. The same *Spermogonia* accompany the *Æcidium* belonging to one *Uromyces*. One similar *Æcidium*, accompanied by similar *Spermogonia*, grows on the Host plants of the other species in very nearly the same characteristic way; but this does not belong to the circle of evolution of the nearest allied *Uromyces*, but, in a highly remarkable manner, to the circle of evolution of quite a different species of *Uromyces* on another Host plant. The two associated fruit-forms of a Fungus closely allied to a species of *Uromyces*, growing on the most nearly allied species of Host plants to this *Uromyces*, thus unexpectedly belong to two perfectly distinct fungi.

It deserves here to be mentioned that *Uromyces Pisi*, Str., is in no way nearly allied to *Uromyces excavatus* (DC.). Irrespectively

of the difference of the Teleutospores, it is very essentially distinguished by its whole biological condition and growth. While *Uromyces excavatus* (DC.) and also *Uromyces scutellatus*, Lév., bring forth only one generation of Teleutospores yearly, *Uromyces Pisi*, Str., forms several successive generations of Uredo stroma, which are finally followed by the Teleutospore pustules; further, the latter grows only in separate little heaps, and is never accompanied by Spermogonia. These parallel species of *Uromyces* belong, therefore, to very different sections of the genus. On the contrary, *Uromyces Pisi*, Str., as already shown above, stands very near to a species on closely allied Host plants.

NOTE.—The reference in “*Grevillea*,” of the *Uromyces* upon *E. exigua* to *U. excavata* has since been found to be an error. With the above observations on the two species of *Uromyces* we mainly concur.—EDITOR.

BERKELEY HERBARIUM.

The unique Herbarium of Fungi which the Rev. M. J. Berkeley has presented to the nation is in course of removal to Kew. As an evidence of the immense value of this collection, we may instance the Order *Agaricini*, which is represented by the following number of species:—

Agaricus . . .	1,286 species.
Hiatula . . .	10 ”
Montagnites . . .	1 ”
Coprinus . . .	49 ”
Bolbitius . . .	8 ”
Cortinarius . . .	90 ”
Gomphidius . . .	4 ”
Paxillus . . .	23 ”
Hygrophorus . . .	85 ”
Lactarius . . .	49 ”
Russula . . .	34 ”
Cautharellus . . .	35 ”
Nyctalis . . .	3 ”
Heliomyces . . .	6 ”
Marasmius . . .	231 ”
Leutinus . . .	110 ”
Panus . . .	33 ”
Xerotus . . .	15 ”
Trogia . . .	4 ”
Schizophyllum . . .	5 ”
Racophyllum . . .	1 ”
Lenzites . . .	35 ”

22 genera . . . 2,087 species

NOTICE OF THE DISCOVERY OF *MONOCLEA* *FORSTERI*, HOOK., IN NEW ZEALAND.

By T. KIRK, F.L.S.

In "Flora Novæ-Zelandiæ" and "The Handbook of the New Zealand Flora," a plant of general distribution in this country is doubtfully described, in the absence of fruit, as *Dumortiera hirsuta*, Nees, the specimens apparently differing from that plant only in their larger size. Fruiting specimens recently obtained near Wellington show that it is the long-lost *Monoclea forsteri*, Hook.* (*Anthoceros univalvis*, G.E. Forst., MS.), all our knowledge of which was obtained from Forster's original specimens, and we were even destitute of exact information as to the locality in which it was collected.

Monoclea is a monotypic genus, and with *Calobryum* forms a section of *Hepaticæ* characterised by the solitary unilocular sporangium destitute of a columella, and having the elaters carried away with the spores.

The thick, fleshy, irregularly-lobed and imbricated fronds of this common plant are so well known to every New Zealand botanist as to need no description. Fructification springing from cavities in the substance of the frond, tumid on the under surface, and opening by slits on the upper surface near the margin. Peduncles 1-3 in each cavity, 1-1½ inch long, succulent, white or yellowish, the base of each surrounded by a delicate, stipitate, tubular perianth $\frac{2}{3}$ -½ inch long, with a two-lobed mouth, the lobes jagged or rarely lacerate, not extending beyond the cavity. Peduncle consisting of two separate tubes closely fitting one within the other. Capsule oblong-cylindrical, coriaceous, faintly striated, sub-erect or inclined, dehiscing longitudinally, at length expanding into an oblong flattened valve, coarsely striated within. Columella 0. Elaters and spores forming a densely matted dark-brown mass; elaters vermiform, with intersecting spiral bands; spores globose, minutely punctate.

The capsule is at first erect, but becomes inclined or even horizontal in dehiscence.

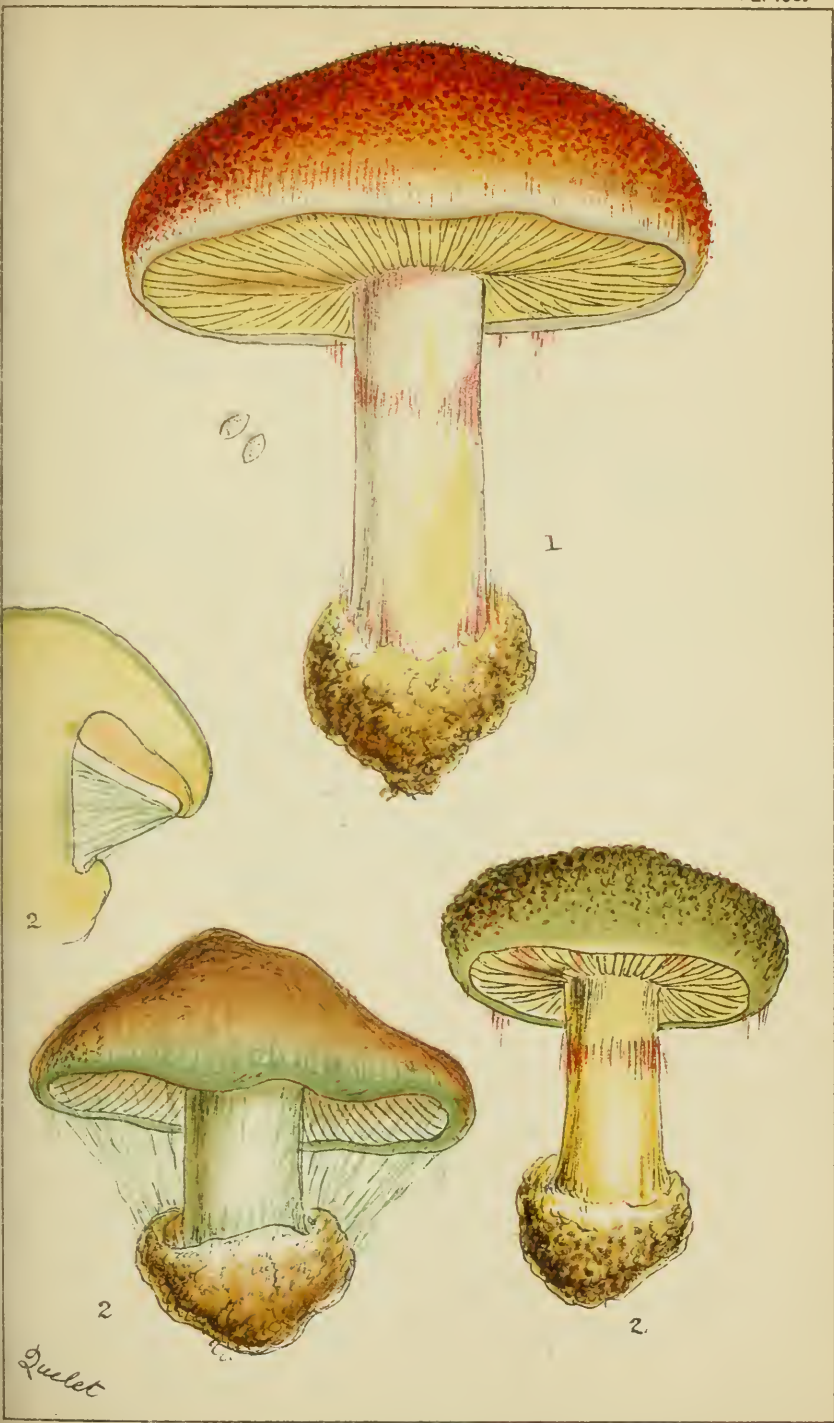
Our plant is frequently found growing in situations where it must be submerged for the greater part of the year; in places of this kind its fronds are perfectly flat and less coriaceous than in the usual state.

The fruiting condition appears to be remarkably local; my specimens were obtained from the head of a gully running into the Kaiwarawara. Mr. Buchanan has collected fruiting specimens at Wainuiomata; these are the only instances of its being found in fruit, since its discovery, most probably in the South Island, by Forster more than a century ago. It appears to fruit only during the spring months, October and November.

* "Musci Exotici," ii., p. 174.

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- LANZI, M. Quelques mots en réponse à M. Petit, in "*Brebissonia.*" No. 9, 1879.



1. Cortinarius orichalceus. 2. Cortinarius prasinus.

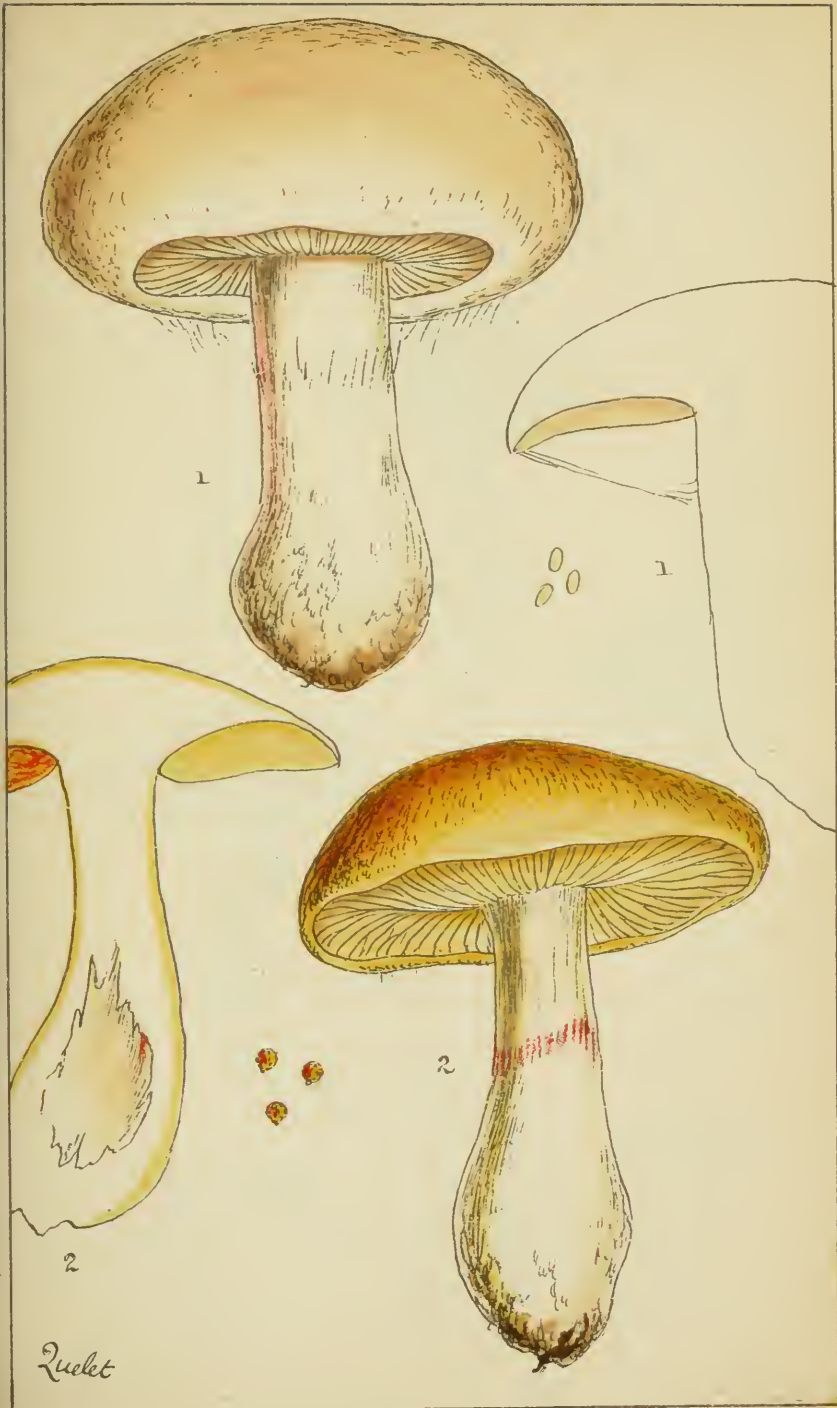


1. *Cortinarius turbinatus*. 2. *Cortinarius scaurus*.





1. *Cortinarius salor*. 2. *Cortinarius delibutus*.



1. *Cortinarius turgidus*. 2. *Cortinarius tophaceus*.



Quelet.

1 *C. caninus*. 2 *C. myrtilinus*.3 *C. miltninus*. 4 *C. cinnabarinus*. 5 *C. sanguineus*



Quelet.

1 *C. anthracinus*.2 *C. cinnamomeus* " *semisanguineus*.3 *C. croceoconus*.4 *C. orellanus*.5 *C. cotoneus*.6 *C. raphanoides*.7 *C. bivelus*.8 *C. urbicus*.

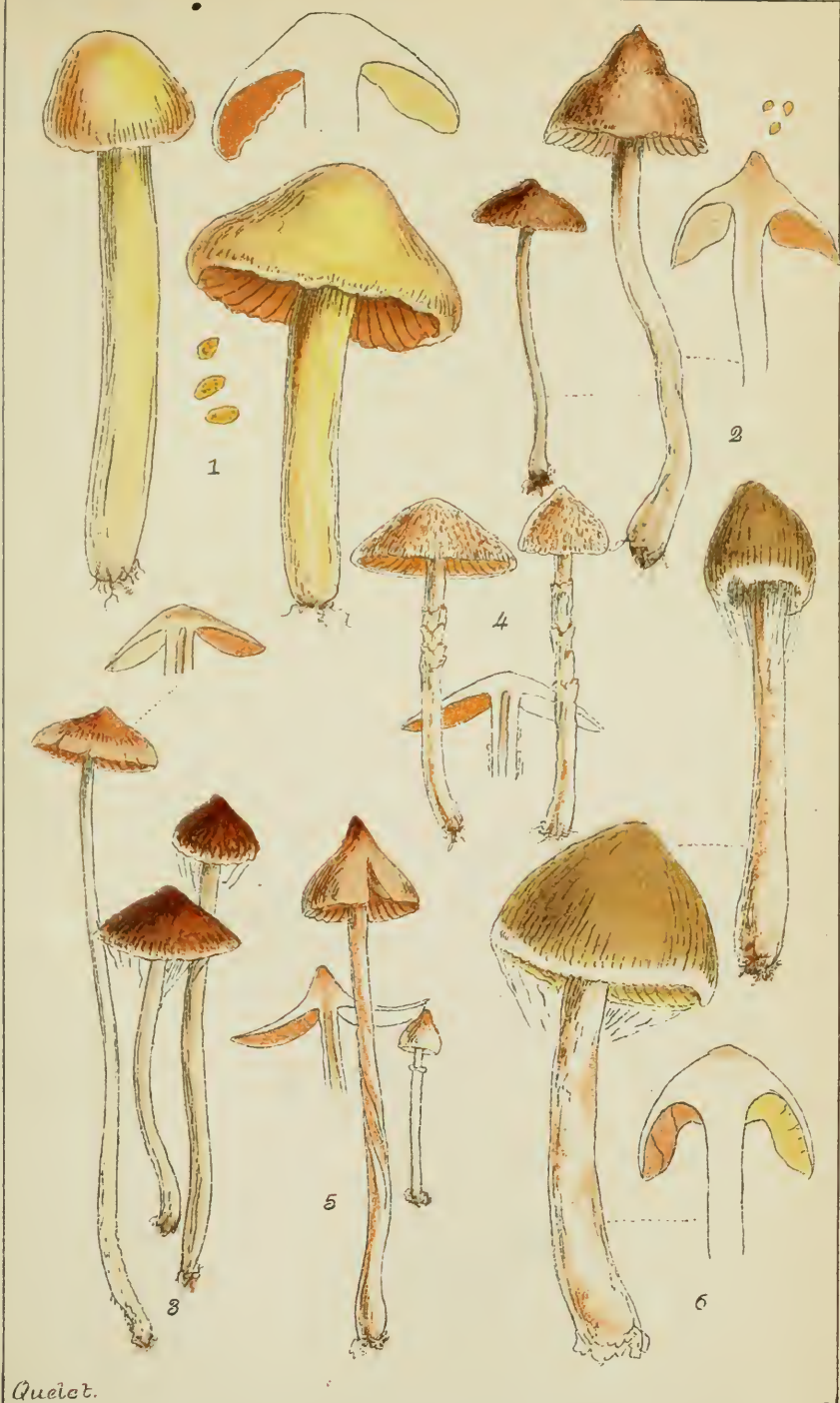


1 *Cort. plumiger.* 2 *C. scutulatus.*
 3 *C. evernius.* 4 *C. limonius.* 5 *C. acutus.*



Quelet.

1 *C. hinnuleus*.2 *C. brunneus*.3 *C. flexipes*.4 *C. rigidus*.5 *C. paleaceus*.6 *C. subferrugineus*.

1 *C. isabellinus*.4 *C. paleaceus*.2 *C. germanus*.5 *C. fasciatus*.3 *C. decipiens*.6 *C. milvinus*.



1 *Cort. durucinus*
3 *Cort. castaneus*.

2 *Cort. erythrinus*.
4 *Cort. sanguineus*



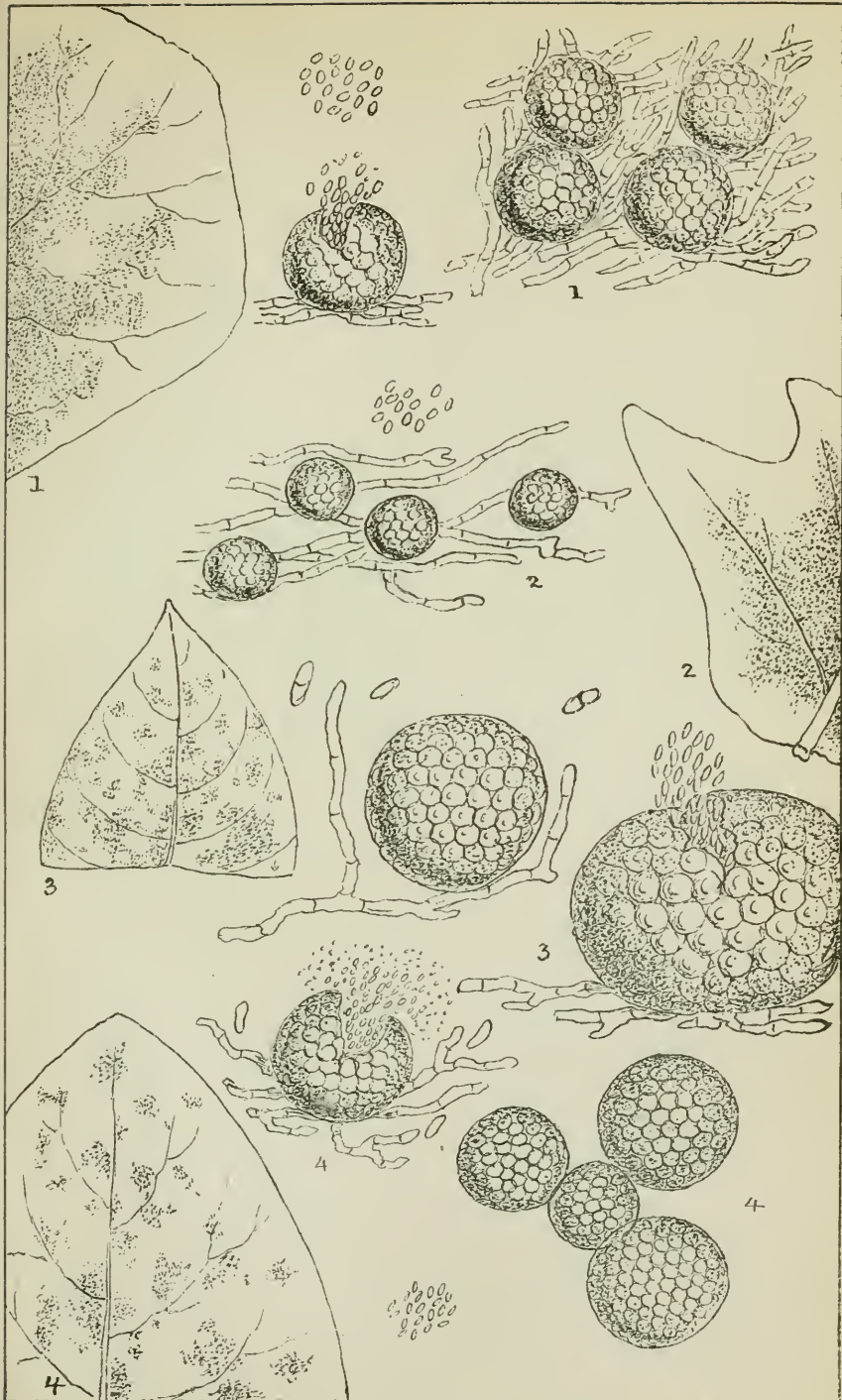
1 *Cortinarius latus*.

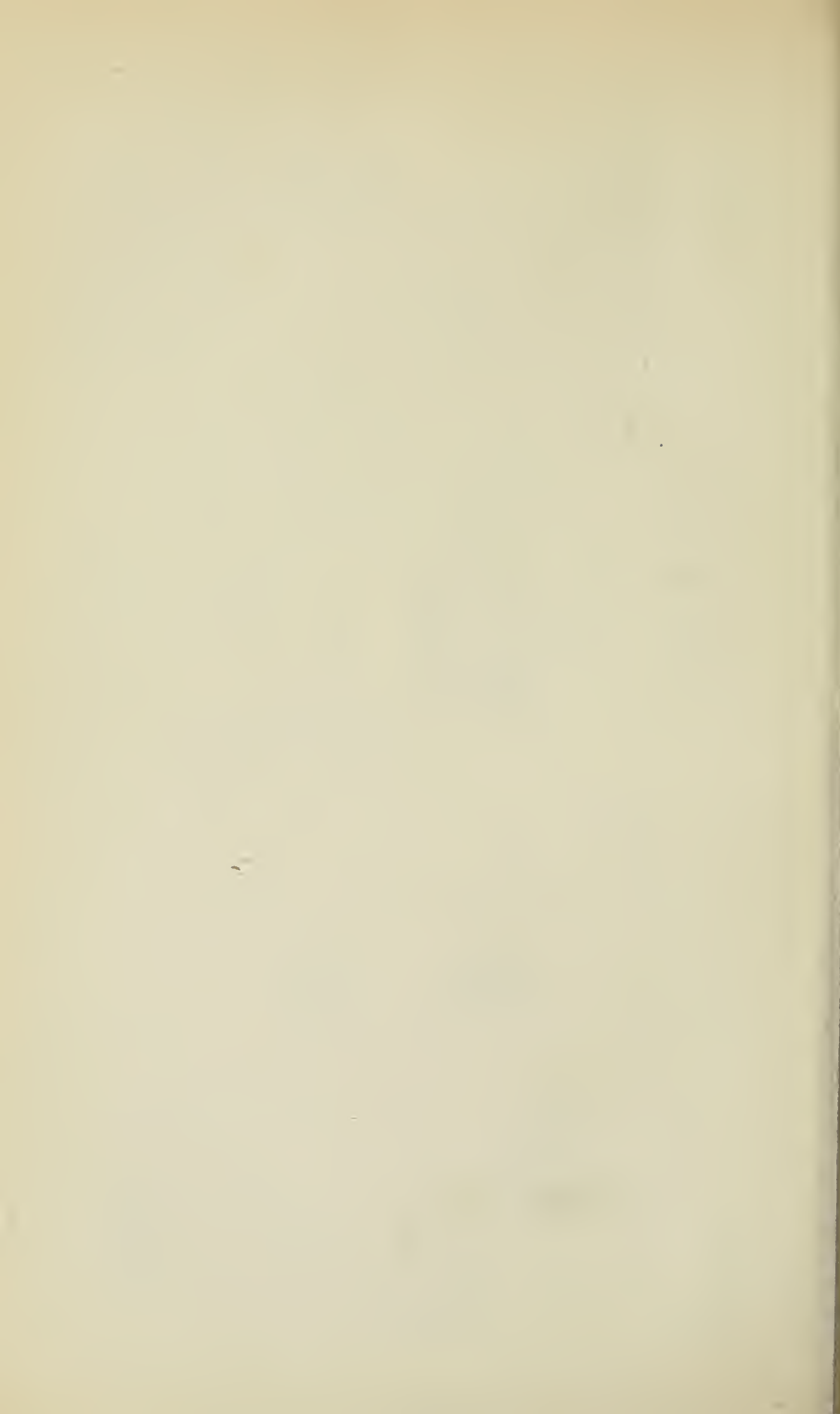
2 *C. fulvescens*.



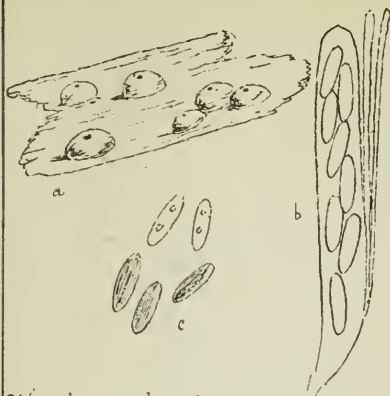
1 *Cortinarius pholideus*.

2 *Cort. torvus* Fr.

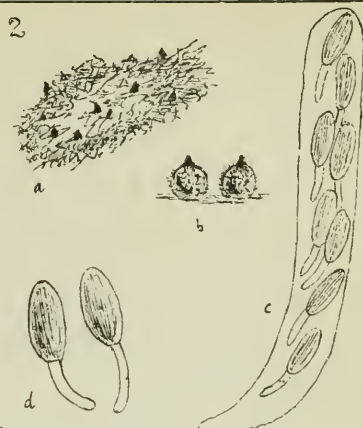
1. *Chaetophoma quercifolia* 2. *C. Catesbeyi*.3. *C. ilicifolia*4. *C. Catalpae*



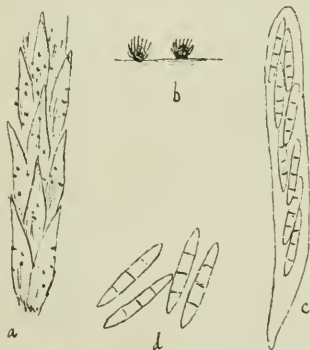
1

*Spiloceria megalocarpa*

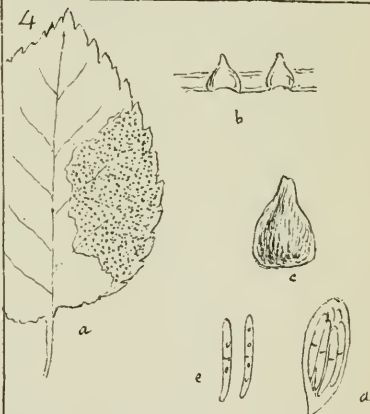
2

*Sordaria Californica*

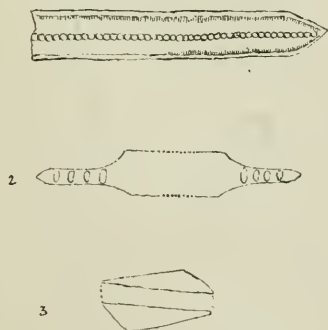
3

*Venturia Sequoia*

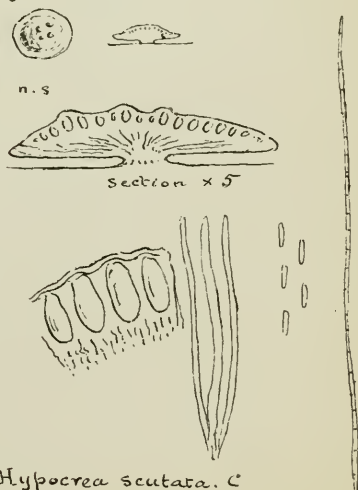
4

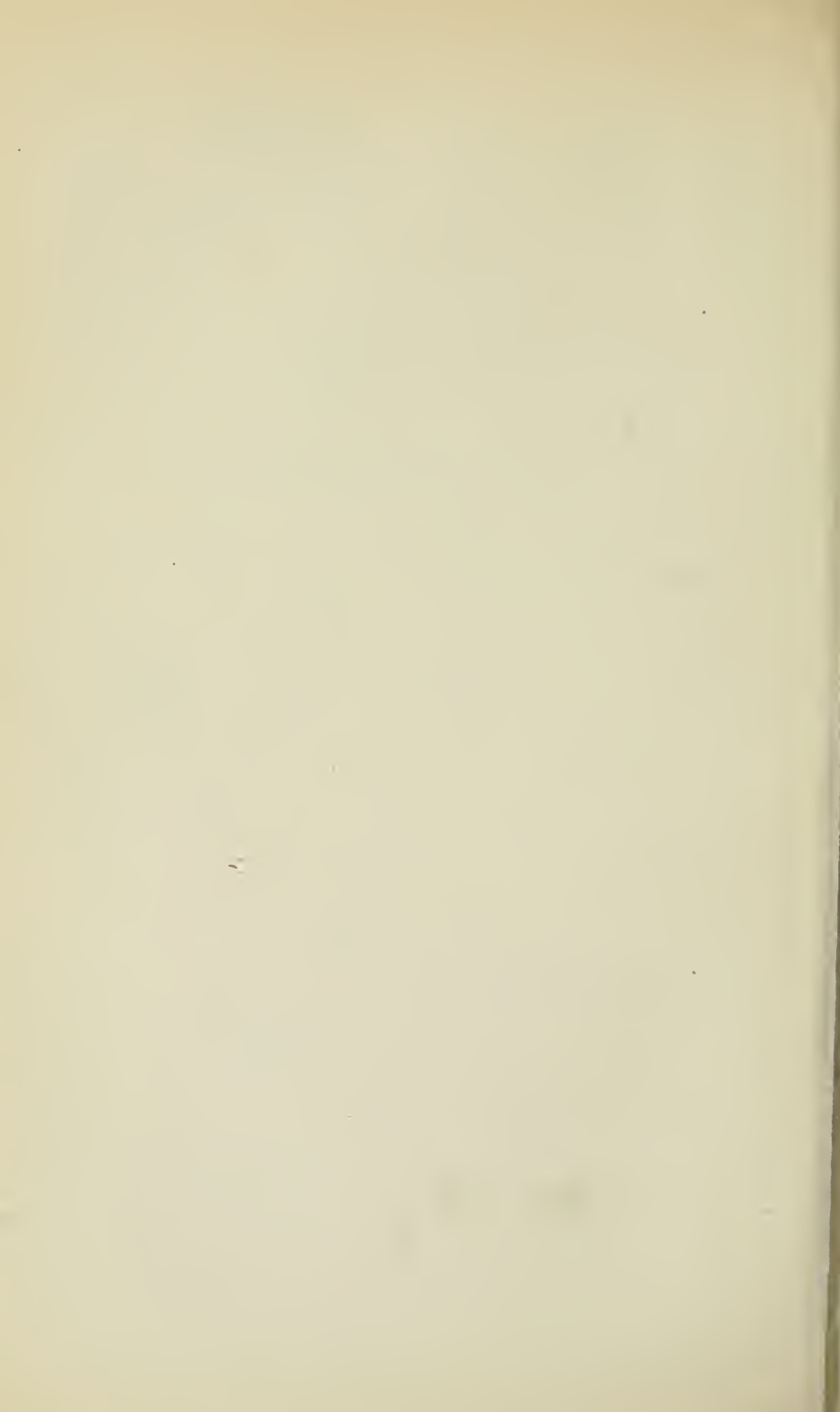
*Guiononia Alni*

5

*Diatoms (F. Kitton.)*

6

*Hypocrea scutata. C*



A



Hygro Wynnica

B



Hygro, fœrens

C

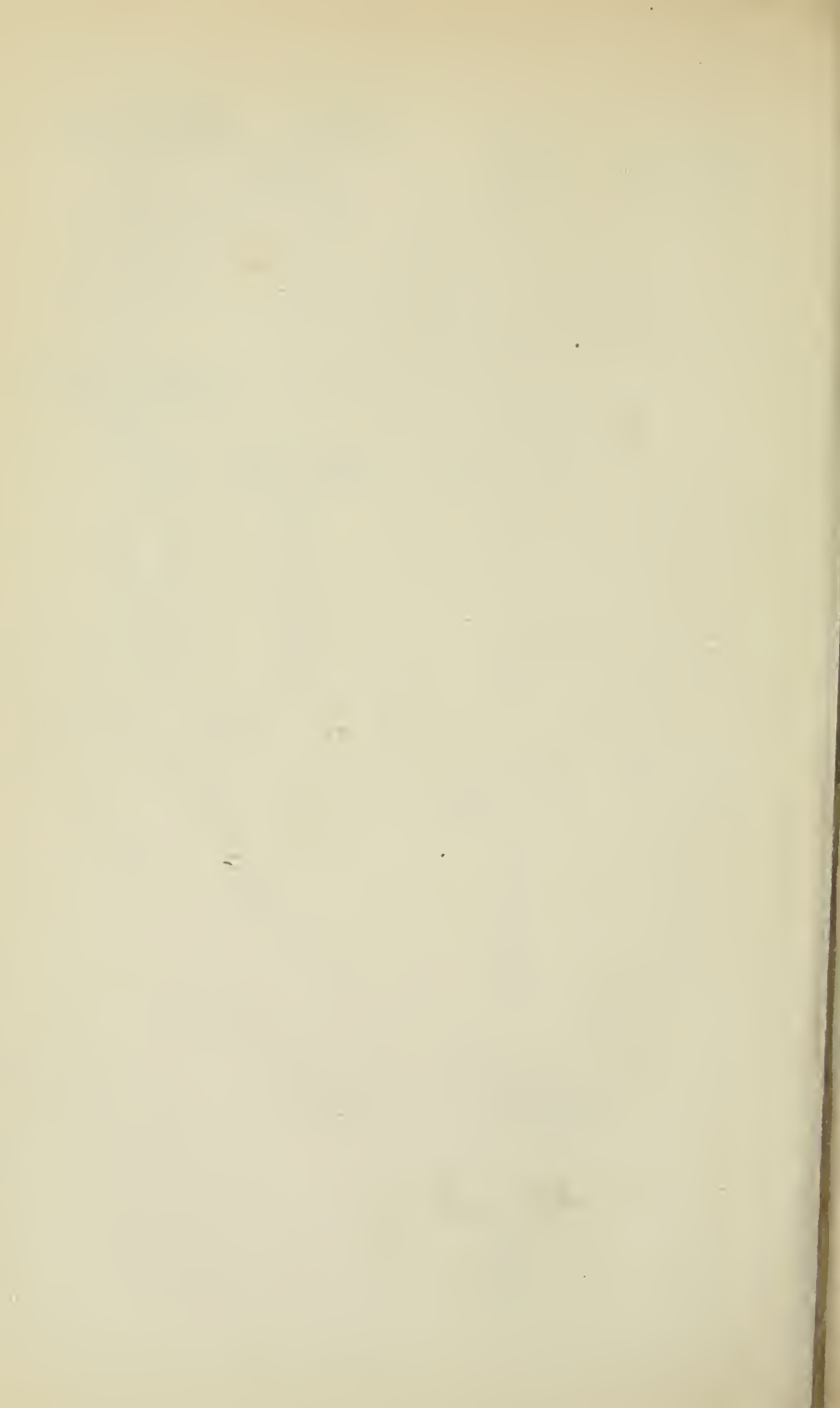


Aq: atrohunctus

D



Aq. Phillipsii



Grevillea,

A QUARTERLY RECORD OF

CRYPTOGAMIC BOTANY

AND ITS LITERATURE.

EDITED BY M. C. COOKE, M.A., A.L.S.,

*Author of "Handbook of British Fungi," "Fungi, their uses," &c.,
"Rust, Smut, Mildew, and Mould," &c., &c.*

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Grevillea,

A QUARTERLY RECORD OF CRYPTOGAMIC BOTANY
AND ITS LITERATURE.

NEW BRITISH FUNGI.

By M. C. COOKE.

(Continued from Vol. vii., pp. 133.)

Cortinarius (Phlegmacium) turmalis. *Fr. Hym. Eur.*, 336.

Pileus fleshy, convex then plane, even, viscid, smooth, discoid; stem cylindrical, white, at first clad with the woolly white veil, then naked; ring fibrillose, annular, persistent; gills emarginate or decurrent, crowded, whitish, then clay-coloured.—*B. & Br. Ann. N. H.*, No. 1774.

In woods. Glamis N.B.

Cortinarius (Dermocybe) decumbens. *Fr. Hym. Eur.*, 366.

Pileus fleshy, convex, expanded, even, smooth, white, then yellowish, shining; stem stuffed, then hollow, clavately bulbous, ascending, smooth; gills adnexed, crowded, clay-coloured.—*B. & Br. Ann. N. H.*, No. 1775.

In woods. Epping.

Cortinarius (Hydrocybe) duracinus. *Fr. Hym. Eur.*, 388.

Pileus fleshy, thin, rigid, convex plane, gibbous, smooth, watery brick-red (or tan coloured); stem stuffed, rigid, unequal, rooting, smooth, silky with the remains of the thin veil; gills adnate, rather crowded, thin, watery cinnamon.—*B. & Br. Ann. N. H.*, No. 1776.

On the ground in woods. Dun, Forfar, N.B.

Hygrophorus ventricosus. *B. & Br.*

White. Pileus convex, fleshy, unequal; stem solid, attenuated towards the apex and the base; gills long, decurrent, narrow.—*B. & Br. Ann. N. H.*, No. 1777.

Amongst grass. Coed Coch.

"Often tinged with red from the growth of a little *Fusisporium*. Pileus 2-3 in.; stem $2\frac{1}{2}$ in., $\frac{1}{2}$ in. thick in the middle, solid, but at length partially hollow; gills sometimes forked."

Hygrophorus penarius. *Fr. Hym. Eur.*, 406. *Fr. Atl. Scam.*, t. 38.

Compact, white then pallid; pileus fleshy, even, smooth, rather dry, opaque; stem solid, firm, unpolished, rough, fusiform, and rooting at the base; gills decurrent, distant, thick.—*B. & Br. Ann. N. H.*, No. 1778.

In mixed woods. Stoke Poges.

Hygrophorus micaceus. *B. & Br.*

Pileus hemispherical, at first yellow, then cinereous, rugose, micaceous; stem yellow, then brown above, granulated, solid; gills decurrent, pallidumber.—*B. & Br. Ann. N. H., No. 1779.*

On clayey soil. Coed Coch.

Hygrophorus fœtens. *Phil. in Grevillea vii., p. 74, t. 121, fig. B.*
B. & Br. Ann. N. H., No. 1780.

Hygrophorus lacmus. *Fr. B. & Br. Ann. N. H., No. 1780.**

On lawns. Coed Coch.

"The base of the stem was in every specimen yellow, which colour remains in the dried plant."

Hygrophorus Wynnii. *B. & Br.*

Lemon coloured, hygrophanous. Pileus umbilicate, or rather infundibuliform, thin, striate; gills narrow, thin, decurrent.—*B. & Br. Ann. N. H., No. 1781. Grevillea vii., t. 121, fig. A.*

On old chips, stumps, &c. N. Wales. Yorks.

"Resembling *Ag. mollis*, Bull., but on a smaller scale, a species which does not seem to have been noticed by Fries. Fœtid when decayed, losing much of its lemon-colour when it parts with its moisture."

Cantharellus cibarius. *Fr. Hym. Eur., 455.*

A curious variety, here and there tinged with pink, approaching somewhat in character *C. Friesii*. When dry not distinguishable from the common form.—*B. & Br. Ann. N. H., No. 1781.**

On the ground. Coed Coch.

Cantharellus Friesii. *Quelet. Jur. p. 191, t. 23, f. 2.*

Pileus fleshy, thin, convex, then depressed, villous, somewhat orange; stem solid, slender, villous; base white, attenuated; gills narrow, fold-like, branched, yellowish.—*B. & Br. Ann. N. H., No. 1782.*

On the ground. Sydenham.

Lactarius scoticus. *B. & Br.*

Pileus depressedly tomentose, then smooth; margin involute, tomentose; flesh firm; stem nearly equal, smooth, somewhat flesh coloured; gills thin, scarcely branched; milk acrid, persistently white; odour pungent.—*B. & Br. Ann. N. H., No. 1783.*

Amongst moss. Aboyne.

Lactarius obnubilus. *Lasch. Fr. Hym. Eur., 438.*

Pileus fleshy, thin, convex, then umbilicate, smooth, rather striate, not zoned, dingy-brown; stem stuffed, then hollow, thin, paler; gills rather crowded, becoming yellowish; milk rather sweet, white.—*B. & Br. Ann. N. H., No. 1784.*

In shady woods. Glamis, N.B.

Russula elephantina. *Fr. Hym. Eur., 440.*

Pileus equally fleshy, firm, convex, umbilicate, smooth, tan colour, then brownish; margin undulated, paler, without striæ; stem hard, obese, white; gills obtusely adnate, rather crowded, thin, white (spotted with grey).—*B. & Br. Ann. N. H., No. 1785.*

In woods. Stoke Poges.

Russula Linnæi. *Fr. Hym. Eur.*, 444.

Mild, pileus everywhere fleshy, plano-depressed, polished, dry, smooth; margin spreading, obtuse, without striæ, flesh spongy-compact, white; stem spongy, solid, obese, cracked, reddish; gills adnate, somewhat decurrent, rather thick, white then yellowish, sometimes forked and anastomosing.—*B. & Br. Ann. N. H.*, No. 1786.

In woods. Stoke Poges.

Russula fellea. *Fr. Hym. Eur.*, 448.

Very acrid. Pileus fleshy, thin, convex plane, opaque, and growing pale; margin even, at length striate; flesh firm; stem spongy, stuffed then hollow, even; gills adnate, crowded, nearly equal, white then straw-coloured.—*B. & Br. Ann. N. H.*, No. 1787.

In beech woods. Coed Coch.

The whole plant lemon-coloured.

Marasmius varicosus. *Fr. Hym. Eur.*, 469.

Inodorous. Pileus rather fleshy, tough, campanulate, then plane, rather umbonate, darker when dry; stem hollow, thin, smooth, rusty, filled with a dark red juice; base tomentose; gills receding, free, much crowded, very narrow, when dry umber-brown.—*B. & Br. Ann. N. H.*, No. 1788.

In mossy places. Apethorpe.

Marasmius impudicus. *Fr. Hym. Eur.*, 471.

Fœtid; pileus rather fleshy, tough, convex plane, or depressed; margin at length striate and plicate, growing pale; stem hollow, equal, becoming purplish, when dry everywhere whitish-velvety, base naked, rooting; gills nearly free, ventricose, flesh coloured, then whitish.—*B. & Br. Ann. N. H.*, No. 1789.

Amongst firs. Hanham.

Marasmius calopus. *Fr. Hym. Eur.*, 472.

Inodorous; pileus rather fleshy, tough, convexo-plane or depressed, even, at length rugose; stem hollow, equal, smooth, not rooting, shining, reddish bay; gills emarginate adnexed, thin, white.—*B. & Br. Ann. N. H.*, No. 1790.

On grass roots, &c. Bristol.

Marasmius institius. *Fr. Hym. Eur.*, 478.

Inodorous; pileus membranaceous, tough, convexo-plane, rather umbilicate, unpolished, at length sulcate; stem horny, hollow, clad with floccose meal, reddish, becoming brownish, attenuated downwards; gills broadly adnate, attenuated behind, distant, simple, unequal, white, then pallid.—*B. & Br. Ann. N. H.*, No. 1792.

On oak leaves. King's Cliffe.

Marasmius Vaillantii. *Fr. Hym. Eur.*, 472.

Inodorous; pileus rather membranaceous, tough, soon flattened, depressed, plicate, becoming whitish; stem stuffed, smooth, bay brown, incrassated at the apex, and paler; gills broad, rather decurrent, thick, distant, white.—*B. & Br. Ann. N. H.*, No. 1791.

In the stoves. Botanic Gardens, Regents Park.

Marasmius saccharinus. *Fr. Hym. Eur.*, 479.

Pileus membranaceous, convex, rather papillate, smooth, sulcate or plicate; stem very thin, flocculose then smooth, reddish; gills broadly adnate, narrow, thick, very distant, joined by veins, whitish.—*B. & Br. Ann. N. H.*, No. 1793.

On leaves, &c. Kings Cliffe, &c.

Marasmius Curreyi. *B. & Br.*

Pileus nearly plane, sulcate, pallid rufous, somewhat radiating, grooves paler, umbo tawny, stem quite smooth, shining, black, white at the apex; gills few, rather ventricose, cream coloured, forming a collar, interstices veined or quite smooth.—*B. & Br. Ann. N. H.*, No. 1794.

On leaves of grass. Fineshade.

Marasmius Broomei. *Berk.*

Half resupinate, pallid brown, striate, then black, hymenium white; gills distant, veined, interstices smooth.—*B. & Br. Ann. N. H.*, No. 1795.

On dead twigs. Batheaston.

Panus Stevensoni. *B. & Br.*

Pileus spathulate, olive yellow, stem dilated above, convex, golden, slightly hispid; gills narrow, entire; flesh greenish yellow.—*B. & Br. Ann. N. H.*, No. 1796.

On oak. Scotland.

Boletus spadiceus. *Schæff., t.*, 126.

Pileus pulvinate, expanded, dry tomentose, bright bay, opaque, then sparsely rimose; stem firm, clavate, even, clad with floccose meal, yellow, then tawny; tubes adnate, yellow; pores minute, rather rounded.—*B. & Br. Ann. N. H.*, No. 1797.

About the base of trunks. Glamis, N.B.

Boletus pusio. *Howse.*

Small, pulverulent; stem thickened downwards, becoming blackish, plicate, springing from a floccose mycelium.—*B. & Br. Ann. N. H.*, No. 1798.

On the ground. Kent.

Polyporus (Anodermei) alutaceus. *Fr. Hym. Eur.*, 545.

Pileus fleshy, then tough, kidney shaped, rather velvety, tan coloured, obsoletely zoned within, margin acute, even; pores very small, thin, rather rounded, whitish, then tan coloured.—*B. & Br. Ann. N. H.*, No. 1799.

On fir stumps. Glamis, N.B.

Polyporus (Anodermei) cerebrinus. *B. & Br.*

Snow white, pulvinate, delicately tomentose, becoming smooth; margin crenate, pores rounded, entire, dissepiments thick, obtuse.—*B. & Br. Ann. N. H.*, No. 1800.

On fir. Glamis, N.B.

“About an inch across. Looks like a portion of some white brain.”

Polyporus (Placodermei) roseus. *Fr. Hym. Eur.*, 562.

Pileus between corky and woody, hard, triquetrous, even, rosy without and within, externally blackened, internally floccose fibrous; pores minute, rounded.—*B. & Br. Ann. N. H.*, No. 1801.

On dressed pine in hothouse. Glamis.

Polyporus (Inodermei) polymorphus. *Rostk.*, iv. t., 56.

Pileus resupinate, effused, coriaceous, margin reflexed, crispate, smooth, umber; pores rather large, angular and torn, pallid.—*B. & Br. Ann. N. H.*, No. 1802.

On fir on a fence. Forres, N.B.

Polyporus (Inodermei) pubescens. *Fr. Hym. Eur.*, 553.

Pileus tough, fleshy, then corky, soft, convex, rather zoned, pubescent, white without and within, margin acute, at length yellowish; pores short, minute, rather rounded, plane.—*B. & Br. Ann. N. H.*, No. 1803.

On broom. Menmuir, N.B.

Polyporus (Inodermei) cryptarum. *Nees.*, fig. 222 B.

Pileus effused, coriaceous, thin, fuliginous, then rufescent; tubes very long.—*B. & Br. Ann. N. H.*, No. 1804.

On fir trees.

"This is not *P. undatus*, Fr, which has a very different texture and colour, though there is a strong external resemblance. It is, in fact, more nearly related to *P. ferruginosus*, and is perhaps a mere state of it."

Polyporus (Inodermei) Herbergii. *Rostk.*, xxix. t., 18.

Caspiotose, rather corky. Pileoli imbricate, bright bay, sulphury about the margin; pores labyrinthiform, unequal, lacerated and dentate, pale cinereous.—*B. & Br. Ann. N. H.*, No. 1805.

On trunks. Edinburgh.

Polyporus (Resupinatus) rhodellus. *Fr. Hym. Eur.*, 573.

Effused, thin, adnate, soft, pale flesh colour, margin determinate, naked; pores minute, rather rounded, contiguous.—*B. & Br. Ann. N. H.*, No. 1806.

On Scotch fir. Glamis, N.B.

Plyporus (Resupinatus) bathyporus. *Rostk.*, iv. t., 59.

Effused, white, circumference thin and byssoid; pores rather large, cupshaped, and toothed.—*B. & Br. Ann. N. H.*, No. 1807.

On dead oak branches. Coed Coch.

"It looks very like a resupinate form of *Dædalea confragosa*."

Polyporus (Resupinatus) radula. *Fr. Hym. Eur.*, 578.

Effused, white, with a tomentose mycelium, soft, villous beneath; pores medium-sized, angular, toothed, pubescent when young.—*B. & Br. Ann. N. H.*, No. 1808.

On sticks. Scotland.

Polyporus (Resupinatus) ramentaceus. *B. & Br.*

Nearly orbicular, subiculum white, tomentose; margin obsolete; pores honey-coloured, broad, rather hexagonal; dissepiments thin, rather rigid, acute.—*B. & Br. Ann. N. H., No. 1809.*

On dead sticks. Glamis, N.B.

Pores $\frac{1}{32}$ in. across.

Polyporus (Resupinatus) reticulatus. *Weinm., p. 339. Fr. Sys. Myc. i., 385.*

Orbicular, thin, fugacious, white; margin radiating, floccose; pores distant, cup-shaped.—*B. & Br. Ann. N. H., No. 1810.*

On rotten wood. Glamis, N.B.

Polyporus (Resupinatus) hymenocystis. *B. & Br.*

Snow-white beneath, and the margin arachnoid; pores broad, dissepiments rough, collapsing, at length pallid.—*B. & Br. Ann. N. H., No. 1810 bis.*

On dead wood. Glamis, N.B.

Trametes purpurascens. *B. & Br.*

Resupinate, rather leathery, externally delicately tomentose, chestnut; hymenium becoming purplish; pores small, dissepiments rigid.—*B. & Br. Ann. N. H., No. 1811.*

On dead willow. Cotterstock.

About $\frac{3}{4}$ in. across; pores $\frac{1}{100}$ in. diam. Resembling some forms of *Polyporus abietinus*.

Dædalea heteromorpha. *Fr. S. M. i., 340.*

Effused, rather membranaceous, dingy-yellowish; margin byssoid; pores irregular, flexuous.—*B. & Br. Ann. N. H., No. 1812.*

On an old post, apparently of fir. Sufton Court.

"This is now referred by Fries to *Lenzites*, but our specimens clearly belong to *Dædalea*."

Hydnum sepultum. *B. & Br.*

Wholly resupinate, golden-yellow; margin white; spines acute, middle-sized.—*B. & Br. Ann. N. H., No. 1813.*

Amongst pine leaves. Glamis, N.B.

"Forming little scattered patches on stones buried amongst pine leaves."

Radulum aterrimum. *Fr. Hym. Eur., 624.*

Innate, throwing off the bark, strigose, black; tubercles elongated, distant, large, deformed, rather compressed, black.—*B. & Br. Ann. N. H., No. 1814. Hydnum erectum, Herb. Sow.*

On birch. Kensington Gardens.

Irpex spathulatus. *Fr. El., p. 146.*

Effused, membranaceous, white, at first byssoid, at length smooth; teeth spathulate, equal, entire, reticulately connected by suppressed veins.—*B. & Br. Ann. N. H., No. 1815.*

On larch. Northumberland.

Thelephora undulata. *Fr. Hym. Eur.*, 633.

Pallid. Pileus between coriaceous and membranaceous, depressed, even, bare; margin entire, undulated; stem short, villous; hymenium costate, setulose.—*B. & Br. Ann. N. H.*, No. 1816. *Schæff. Icon.*, t. 278.

On the ground. Coed Coch.

Hymenochæte Stevensoni. *B. & Br.*

Pallid fawn colour, rigid; margin obtuse, elevated, hispid with rufous bristles.—*B. & Br. Ann. N. H.*, No. 1817.

On bark of yew. Glamis, N.B.

"A very curious and distinct species."

Stereum ochroleucum. *Fr. Hym. Eur.*, 639.

Pileus between coriaceous and membranaceous, free, expanded, flaccid, silky, zoned, hoary; hymenium even, smooth, yellowish.—*B. & Br. Ann. N. H.*, No. 1818.

On trunks. Glamis, N.B.

"Often resupinate."

Corticum porosum. *B. & Curt.*

Resupinate, milk white, here and there porose; margin free, reflexed.—*B. & Br. Ann. N. H.*, No. 1821.

On trunks. Aboyne.

"Apparently the same with specimens from Venezuela. The pores look as if little dewdrops had settled on the hymenium, which had in consequence contracted, or rather retracted."

Corticum puberum. *Fr. Hym. Eur.*, 652.

Broadly effused, waxy, adnate, indeterminate, white or clay-coloured; hymenium even, velvety with short setæ, cracked when dry.—*B. & Br. Ann. N. H.*, No. 1822.

On wood. Scotland, Hereford, Sydenham.

Corticum subdealbatum. *B. & Br.*

Effused, white; hymenium fawn-coloured from the pale setæ.—*B. & Br. Ann. N. H.*, No. 1823.

On fir. Badminton.

Apparently the same thing occurs in Pennsylvania, U.S.

Corticum fœtidum. *B. & Br.*

Fœtid, effused, resupinate, arachnoid beneath, white then ochraceous, smooth.—*B. & Br. Ann. N. H.*, No. 1824.

On sawdust. Coed Coch.

Corticum scutellare. *B. & Curt. Grevillea i.*, No. 232.

Resupinate, effused, immarginate, whitish or somewhat clay-coloured; hymenium cracked in minute areolæ.—*B. & Br. Ann. N. H.*, No. 1825.

On *Ulex*. Scotland.

Clavaria Kunzii. *Fr. Hym. Eur.*, 669.

Rather fragile, very much branched from a thin base, white; branches elongated, crowded, repeatedly forked, fastigiate, even, equal, compressed at the axils.—*B. & Br. Ann. N. H.*, No. 1819.

On the ground.

Clavaria ligula. *Fr. Sys. Myc. i., 477.*

Simple, gregarious, spongy, fleshy, elongated clavate, obtuse, villous at the base, yellowish when young, rufescent or pallid when mature.—*B. & Br. Ann. N. H., No. 1820.*

In woods. Scotland.

Octaviana compacta. *Tul. Hym. 79, t. xi., f. 3.*

Small, snowy-white; peridium rather soft, cottony; cells rounded or oblong, very minute, soon obliterated, septa scarce conspicuous; spores very small, spherical, rough, yellowish, then ochraceous ($\cdot 0056\text{--}\cdot 0064$ mm.).—*B. & Br. Ann. N. H., No. 1826.*

In woods. Shoreham.

Exobasidium Rhododendri. *Cramer.*

Forming subglobose or irregular fleshy nodules, resembling galls, of a bright reddish colour on young shoots and leaves. Spores cylindrical ($\cdot 008$ mm.).—*Rabh. Fun. Eur., No. 1910, Gard. Chron., 1879, pp. 119, 182.*

On *Rhododendron ferrugineum*, and other species. Bodorgan, &c.

Phoma Mulleri. *Cke.*

Punctiform, scattered; perithecia small, covered, piercing the cuticle with the short ostiola; spores narrowly elliptical, hyaline, with a nucleus at either extremity ($\cdot 01\text{--}\cdot 012 \times \cdot 003$ mm.).

On *Rubus*. Eastbourne (C. J. Muller).

Sporidesmium digitatum. *Cke.*

Effused, black, densely velvety, extending for some inches. Spores in fascicles, two to four together, obelavate flexuous, dark brown, paler above, multiseptate ($\cdot 08\text{--}\cdot 012 \times 015$ mm.).

On holly branches. Neatishead, Norfolk.

Fusisporium filisporum. *Cke.*

Tufts minute, seated amongst the leaves beneath the capsules of mosses, rosy; spores filiform, very long, multiseptate, with a tendency to break at the joints ($0\text{--}17$ mm. long).

On *Orthotrichum*. Eastbourne (C. J. Muller).

Leotia Stevenstoni. *B. & Br.*

Short, densely caespitose; pileus and stem greenish.—*B. & Br. Ann. N. H., No. 1827.*

On the ground. Glamis.

"This has a very different habit from *Leotia lubrica*, and approaches *L. atrovirens*. There does not appear to be any decided difference in the fruit."

Peziza (Humaria) ollaris. *Fr. Sys. Mic. ii., 68.*

"*Mycographia*," fig. 56.—*B. & Br. Ann. N. H., No. 1828.*

On the ground. Glamis. Hereford.

Peziza (Patellea) Euphorbiæ. *B. & Br.*

Minute, sessile, margin rather prominent, black; hymenium white; asci clavate; sporidia biseriate, globoso-elliptical.—*B. & Br. Ann. N. H., No. 1829.*

On stems of *Euphorbia amygdaloides*. Batheaston.

"Cups $\cdot 016$ in.; sporidia $\cdot 0002$ in. ($\cdot 005$ mm.) long, and nearly as broad."

Patellaria pallida. Berk.

Gregarious, sessile, pallid, margin rather obtuse; sporidia biseri-
ate, oblong, slightly curved.—*B. & Br. Ann. N. H.*, No. 1831.
On smooth bark.

Sporidia $\cdot 0005$ in. ($\cdot 0125$ mm.) long.

Phacidium leptidium. Fr. *S. M.* ii., 576.

Somewhat innate, depressed, plane, black, splitting into several
acute laciniae, disc straw-coloured; sporidia filiform, curved, hya-
line ($\cdot 086 \times \cdot 003$ – $0\cdot 04$ mm.—*B. & Br. Ann. N. H.*, No. 1830.

On *Vaccinium myrtillus*. Scotland.

Rhytisma radicalis. Cke.

Black, opaque, ambient, splitting irregularly, and exposing the
grey hymenium; asci cylindrical; sporidia uniseriate, clavate,
hyaline ($\cdot 012 \times \cdot 003$ mm.); stylospores produced earlier in the
season, fusiform, acute, triseptate ($\cdot 07 \times \cdot 005$ mm.).

About the roots of *Rhinanthus crista galli*. North of Scotland
(Mr. Taylor).

Gouty black swellings are formed both by the stylosporous and
ascosporous conditions. The sporidia apparently not fully mature.

Hypocrea riccioidea. Berk., in Cke. *Hdbk.*, No. 2329.

Hypocrea parmelioides, Mont. Syll.—*B. & Br. Ann. N. H.*, No.
1831*.

This curious species, which is *Sphaeria riccioidea*, Bolt, has lately
been found on willow twigs by the Rev. J. Stevenson, at Glamis.

Hypomyces chrysospermus. Tul. *Sel. Carp.*, iii., 49.

Perithecia numerous, in a dense compact stratum, ovoid, at first
hyaline then dingy yellow; asci cylindrical; sporidia elongated,
unequally pseudo-septate, hyaline ($\cdot 021$ – $\cdot 025 \times \cdot 006$ mm.); conidia
as in *Sepedonium chrysospermum*.—*B. & Br. Ann. N. H.*, No. 1832.

On *Boleti*. Coed Coch.

Nectria aurea. Grv. *S. Cr. Fl.*, t. 47.

Aurea. Peritheciis sparsis vel gregariis, ovatis, ceraceis, circa
ostiolis obscurior; asci cylindraceis; sporidiis uniseriatis, ellipticis,
hyalinis, uniseptatis, nec constrictis, utrinque rotundatis ($\cdot 017 \times$
 $\cdot 0075$ mm.) “Cooke *Hdbk.*,” p. 785.

On semi-putrid fungi.

The above measurements determined from the original specimens.

Nectria affinis. Grv. *S. Cr. Fl.*, t., 186.

Aurantia. Peritheciis sparsis, globosis, glaberrimis, ad basim
albo-floccosis; asci cylindraceis; sporidiis arcte ellipticis.

On *Ephebe pubescens*. Appin (Carmichael).

This has been omitted so long on account of our not having
examined authentic specimens. Those from Greville and also
from Roussel, do not accord with the description given by Saccardo,
under *Paranectria affinis* (“*Michelia*,” i., p. 317), which must be
a different species. The perithecia are as large as in *N. sanguinea*,
the sporidia although immature, would probably not exceed $\cdot 012$
mm. in length, and seem to be uniseptate, but of this we could
not be certain.

Nectria epigæa. Cooke.

Aurantio-coccinea. Peritheciis subglobosis, depressis, subgranulatis, poro pertusis, mycelio albo tenue insidentibus; asci cylindraceis; sporidiis ellipticis, uniseriatis, hyalinis, uniseptatis, vix constrictis (0.13×0.005 mm.).

On the ground. Penecuk, N. B.

Allied to *N. sanguinea*, but the perithecia are paler, by no means so even, and more or less surrounded by white fibrils at the base. In external appearance the species are evidently quite distinct, as well as internal characters. We have not seen *Nectria terrestris*, Cronan, which does not wholly accord in description with the above.

Xylaria tortuosa. Sow. M. S., in Herb. Kew.

Corky, brittle, repeatedly branched, slender and rhizomorphoid, black, about 4 inches high, here and there bearing clavate fertile branches, which are obtuse; perithecia rather prominent, crowded; asci cylindrical; sporidia uniseriate, narrowly fusiform, obtuse at the ends, slightly curved, brown ($0.02-0.022 \times 0.004$ mm.).

On the ground. Kew Herbarium (Sowerby).

This specimen is labelled "*Sphæria tortuosa*, J. S.," and thus noted:—"Found at Mead Place, and I have given Mr. Dickson the first publishing of it. I don't know what Mr. D. will call it." This specimen passed to Mr. Dawson Turner, and has apparently never been described. In form it resembles the *Xylaria guepini*, var. *eupeliaca*, figured by Cesati in the "Comm. Soc. Critt. Ital.," but the sporidia are very much larger, at least 4 or 5 times as long. It also somewhat resembles *X. rhizomorpha*, Mont., but the sporidia in that species are very small. There is no other species to which it would be referred. It could scarcely be any condition of *Xylaria polymorpha*, which has similar but rather narrower sporidia.

Sphæria corniella. Cke.

Perithecia scattered, covered, piercing the cuticle with the erumpent ostiola. Asci clavate. Sporidia uniseriate elliptical, or somewhat fusiform, hyaline (0.02×0.006 mm.).

Botryosphæria corni, Sacc. Fun. Ital., fig. 182, not *Sphæria Corni*, Sow.

On twigs of *Cornus*. Shrewsbury. (Rev. W. A. Leighton, in Kew Herbarium.)

Sphærella thallina. Cke.

Perithecia scattered over the thallus, minute, semi-immersed, dark-brown, scarcely papillate; asci clavate; sporidia biseriata, elliptical, hyaline, uniseptate, scarce constricted at the septum (0.015×0.005 mm.).

On thallus of *Physcia obscura*. Eastbourne (C. J. Muller).

Orbicula perichænoides. Cke.

Scattered, superficial. Perithecia orbicular, depressed, ruptured irregularly, and exposing the pale contents; asci cylindrical; sporidia globose, hyaline ($0.01-0.012$ mm.), uniseriate, mixed with numerous filiform paraphyses; asci soon dissolved.

On old fir beams. Forres (Rev. J. Keith).

Eurotium fulvescens. *Cke.*

Asci minute, globose, attached in groups to slender threads.
= *Badhamia fulvescens*, Cke. in "Grevillea," iv., p. 69.

On old sacking. Near Perth, N. B.

This was described as a *Badhamia*, but a closer examination has shown that the sacs which enclose the spores are true asci, and that the plant is most nearly related to *Eurotium*.

NEW JERSEY FUNGI.

By M. C. COOKE AND J. B. ELLIS.

(Continued from Vol. VII., page 42.)

Corticium fusisporum. *C. & E.*

Irregulariter effusum, carnosum, molle, olivaceo-fuscum, ambitu mucedineo pallido; hymenio subundulato, sporis fusiformibus, fuscis, pulverulento ($0.25-0.28 \times 0.005$ mm.).

On stumps (?)

No. 3092.

Very similar to *C. puteanum*, Fr.; separating from the matrix readily. Thin and soft.

Diplodia glandicola. *C. & E.*

Sparsa. Peritheciis minimis, atris, vix prominulis. Sporibus ellipticis, uniseptatis, brunneis ($0.25-0.28 \times 0.012$ mm.), nec constrictis.

On hazel nuts.

No. 3178.

Septoria tenella. *C. & E.*

Sparsa. Peritheciis atris, punctiformibus, prominulis; sporibus linearibus, rectis vel curvulis, hyalinis (0.04 mm. long).

On *Festuca tenella*.

No. 3079.

Septoria Liquidambaris. *C. & E.*

Epiphylla. Maculis brunneis, suborbicularibus, minimis. Peritheciis atrobrunneis, congestis; sporibus flexuosis, linearibus ($0.055-0.06$ mm. long).

On leaves of *Liquidambar*.

No. 3186.

Phyllosticta phaseolina. *Sacc. in Michelia.*

On leaves of *Phaseolus diversifolius*.

No. 3184.

Phyllosticta acericola. *C. & E.*

Epiphylla. Maculis pallidis, purpureo-cinctis. Peritheciis punctiformibus, dispersis; sporibus ovatis, hyalinis (0.008×0.005 mm.).

On maple leaves.

Nos. 3081, 3093.

Sporidesmium conglobatum. *C. & E.*

Atrum. Cæspitulis sphaeræ-formibus, gregariis, opacis; sporibus ellipticis vel clavatis, aterrimis, opacis, cellulosis, in cæspitulis dense congestis ($0.1-0.12 \times 0.03-0.035$ mm.).

On naked wood.

No. 3172.

Spores somewhat resembling those of *S. stygium*, but with the habit of a *Sphaeria*. Tufts about one-fourth mm. diameter. No. 2188 of a previous series is *S. stygium*.

Tetraploa Ellisii. Cke.

Effusa, atra; sporis ternatis vel quaternatis, obclavatis, septatis, superne liberis, divergentibus, attenuatis.

On old stalks of maize.

Differing from *T. aristata* in its broad black patches, in the larger spores, in the manner in which the spores are regularly attenuated into the awns, the smaller angle at which they diverge, and in the general form of the complex spore, the parts being much less fused together so as to have a more distinct resemblance to a compound *Sporidesmium*.

Stilbum parvulum. C. & E.

Sparsum vel subfasciculatum, parvulum, pallidum, capitulis subglobosis. Stipite ad basin tomentoso, erecto, gracili. Sporis arcte ellipticis, hyalinis (0.012×0.004 mm.).

On rotten wood.

No. 3132.

Monilia aureofulva. C. & E.

Læte aurantio-rubra, sub-effusa, margine pallidiore. Hyphis sparse ramosis, intricatis, septatis; sporis apicalibus, amygdalæformibus, denum ovalibus, aurantiacis, primo pauce concatenatis dein liberis (0.25×0.02 mm.).

On old oak.

No. 3155.

Closely allied to *Monilia hesperidea*, Sacc., but more effused, and of a different colour. The spores are formed consecutively by constriction of the tips of the threads. Seldom more than two spores are seen adhering in a chain.

Stachylidium fuscum. C. & E.

Effusum, fuscum. Hyphis fasciculatis, erectis; ramulis brevibus, obclavatis, verticellatis, sporis minimis, ellipticis (0.004×0.002 mm.), in capitulis globosis congestis.

On wood of *Magnolia*.

No. 3198.

Trichothecium griseum. Cke. in "Grevillea."

On *Panicum sanguinale*.

No. 3087.

Campsotrichum flagellum. C. & E.

Murinaceum. Cæspitulis sparsis, hémisphericis. Hyphis erectis, septatis, brunneis, superne in 3-5 ramulis flagelliformibus flexuosis, decumbentibus divisis. Sporis cylindræcis ($0.15-0.2$ mm. long).

On herb stems.

No. 3160.

Macrosporium porri. Ellis.

Effusum, fuliginosum. Hyphis brevibus, simplicibus, subfasciculatis. Sporis elongato-clavatis, in stipitem attenuatis, multiseptatis, fuscis ($0.15-0.18$ mm. \times $0.15-0.02$ mm.).

On *Allium porrum*.

No. 3167.

The large clavate spores are attenuated in the lower third of their length into a closely septate stem. It is one of the largest spored species with which we are acquainted.

Helminthosporium leptotrichum. *C. & E.*

Tenuiter effusum, atrum. Hyphis tenuibus, erectis, simplicibus, septatis, sporis ellipticis, triseptatis, fuscis ($.02-.025 \times .008$ mm.).

On rotten oak and *Polyporus*. No. 3168.

Flocci slender, erect, simple, thinner than is usual in the genus, neither constricted nor nodulose; and more resembling the threads of a *Menispora*.

Peziza (Mollisia) subatra. *C. & P.*

On *Nissæa verticellata*. No. 3021.

Sporidia more clavate than usual.

Peziza (Mollisia) atrata. *Per.*

On *Ambrosia trifida*. No. 2994.

Peziza (Mollisia) atrocinerea. *Cke.*

On *Hypericum*. No. 3085.

On *Desmodium*. No. 3066.

Peziza (Mollisia) denigrata. *Kunz. in Rabh. F. Eur.* No. 2121.

On *Festuca tenella*. No. 3079a.

Agyrium sexdecimsporum. *Fekl. Sym., pp. 283.*

On rotten *Nyssa*. No. 3071.

Glonium nitidum. *Ellis.*

Peritheciis gregariis, ellipticis, atris, nitidis, parvulis, labiis con-niventibus. Sporidiis arcu ellipticis, uniseptatis, hyalinis ($.008-.01 \times .003$ mm.).

On decorticated branches. No. 3016.

Nectria cucurbitula. *Curr.*

This is the form with very numerous minute sporidia, to which Saccardo has applied the name of *Chilonectria cucurbitula* in *Michelia* i., p. 280. Whether the polysporous form should be separated from the octosporous form is not necessary to be discussed here.

On pine limbs. No. 3083.

Eutypa subsecta. *Fr.—Nke. Pyr. Germ.*

On bark of *Salix*.

Valsa clausa. *C. & E.*

Caespitulis in cortice nidulantibus, supra tectis. Peritheciis 4-6 subglobosis; ostiolis brevibus, convergentibus; ascis clavatis; sporidiis biseriatis, allantoideis, hyalinis ($.016-.018$ mm. long).

On branches of *Quercus coccinea*. No. 3100.

The bark is elevated, but scarcely pierced by the convergent ostiola.

Valsa chlorodisca. *C. & E.*

Pustulis cortice tectis; disco sordide luteo, ostiolis nigris, cylindricis, punctato; ascis clavatis; sporidiis biseriatis, allantoideis, hyalinis ($.01$ mm. long).

On Hickory. No. 3226.

The dirty yellow disc is sufficient to distinguish this from its immediate allies.

Valsa multiplex. C. & E.

Pustulis magnis, erumpentibus, elevatis; disco brunneo; ostiolis numerosis, nigris, congestis; ascis clavatis; sporidiis biserialis, allantoideis, hyalinis (.01 mm. long).

On *Quercus coccinea*. No. 3106.

The pustules are large and prominent as in some species of *Diatrype*. The small ostiola are very numerous, crowded together in a brown stroma.

Valsa macluræ. C. & E.

Pustulis sub-corticalibus, ostiolis congestis, tandem expositis, brunneo-cinctis; ascis clavatis; sporidiis minimis, allantoideis, hyalinis (.005 mm. long).

On *Maclura aurantiaca*. No. 3104.

Valsa pauperata. C. & E.

On *Acer*. No. 3200.

Valsa pulchelloidea. C. & E.

On *Quercus*. No. 3212.

Valsa ligustrina. Cke.

Tecta, in cortice immersa. Pustulis minimis, inconspicuis. Peritheciis paucis, ostiolis abbreviatis; ascis clavatis; sporidiis allantoideis, hyalinis (.008 mm. long).

On *Andromeda ligustrina*. Nos. 2895, 3211.

"My coadjutor regards this as a variety of *Valsa delicatula*, C. & E., an opinion in which I cannot concur."—M. C. C.

Valsa excorians. C. & E.

Pustulis in cortice immersis, elevatis, erumpentibus et epidermidem ramorum excutientibus; disco primo sordido; ascis clavatis; sporidiis allantoideis, minimis, hyalinis (.005-.006 mm. long).

On branches of *Pyrus arbutifolia*, &c. No. 3095.

This has evidently been a species mixed up with *Valsa decorticans*, Fr., which it closely resembles, except that the sporidia in that species are nearly .01 mm. long, and in this scarcely exceeding half that length. In Europe the two species are evidently mixed together in herbaria.

Valsa subcuticularis. C. & E.

Circinata. Peritheciis globosis, decumbentibus, sub-epidermidem nidulantibus, ostiolis elongatis tenuibus, convergentibus; ascis clavatis; sporidiis allantoideis, hyalinis (.006-.007 mm. long).

On branches of Holly. No. 3103.

The bark is slightly raised and punctured by the ostiola, but the pustules are scarcely visible externally. When the cuticle is removed, the circinating perithecia remain attached to the inner bark, somewhat like very small *V. pulchella*.

Valsa Aceris. Nke.

Diaporthe Aceris, Fckl. Symb., pp. 204.

A distinct variety, perhaps species.

On *Acer*.

No. 3201.

Valsa corymbosa. *C. & E.*

Peritheciis atris, globosis, in ligno immersis, 6-10 nigro-cinctis; ostioliis erumpentibus; ascis cylindraceis; sporidiis uniseriatis, ellipticis, uniseptatis, leniter constrictis, nucleatis, granulatis, hyalinis ($.018-.02 \times .008-.009$ mm.).

On branches of *Vaccinium corymbosum*.

No. 3224.

Allied to *V. personata*, *C. & E.*, but the sporidia are different in form.

Valsa apocrypta. *C. & E.*

Tecta, lineata. Peritheciis immersis, inconspicuis; ascis clavatis; sporidiis biseriatis, elongato-ellipticis, uniseptatis, vix constrictis, hyalinis ($.025-.028 \times .008-.009$ mm.).

On Hickory.

No. 3099.

Scarcely visible externally.

Valsa phæospora. (*Sacc.*). *Fenestella phæospora.* "*Sacc. Fun. Ital.*," fig. 140.

On *Quercus alba*.

Nos. 3216, 3217.

With large fenestrate sporidia.

Sphæria (Lasiosphæria) atrobarba. *C. & E.*

Superficialis. Peritheciis parvulis $\frac{1}{10}-\frac{1}{8}$ mm. subglobosis, pilis rigidis erectis obsitis; ascis cylindrico-clavatis; sporidiis uni-vel biseriatis, arcte ellipsoideis, triseptatis, fuscis, constrictis ($.012-.014 \times .004-.005$ mm.).

On decorticated branches.

No. 3189.

Sphæria (Psilosphæria) atrograna. *C. & E.*

Sparsa, superficialis. Peritheciis subglobosis, parvulis, leniter scabrosis, obtusis, atris, opacis; ascis cylindraceis; sporidiis uniseriatis, arcte ellipticis, uniseptatis, brunneis ($.012-.014 \times .005$ mm.).

On *Liquidambar*.

No. 3179.

Sphæria avocetta. *C. & E.*

Sparsa, immersa, dein libera. Peritheciis atris, globosis, supra in collo longe attenuatis; ascis cylindraceis; sporidiis arcte ellipticis ($.012 \times .005$ mm.) brunneis.

On rotten wood.

No. 2860.

Perithecia at first immersed in the rotten wood, the long bent ostiola alone visible, then, as the friable wood is washed away, becoming naked, the ostiola soon broken off, thus presenting the appearance of *Ceratostoma* at one time, and at another of one of the *Denudate*. Sporidia as in *S. arctespora*, which is apparently but a form of *S. xylariæspora*, without the short hairs on the perithecia.

Sphæria (Caulicolæ) buccera. *C. & E.*

Sparsa, epidermide tecta. Peritheciis subglobosis, prominulis, atris; ascis cylindrico-clavatis; sporidiis biseriatis, fusiformibus, triseptatis, hyalinis, leniter curvulis, utrinque cornuto-appendiculatis ($.03-.032 \times .0075$ mm. sine appendiculis).

On herbaceous stems.

No. 3059.

The hyaline horns of the sporidia are ultimately absorbed.

Sphæria (Caulicolæ) virginica. C. & E.

Sparsa, erumpens. Peritheciis subglobosis, atris, papillatis, prominulis; ascis cylindrico-clavatis; sporidiis uniseriatis, fusiformibus, 5-septatis, rectis vel curvulis, fuscis ($.06 \times .01$ mm.).

On *Lepidium Virginicum*.

No. 3003.

Sphæria (Follicolæ) heloniæfolia. C. & E.

Amphigena. Peritheciis sparsis, punctiformibus, prominulis, cuticulâ tectis ($0.12-0.15$ mm.). Sporidiis ellipticis 1-2 septatis, constrictis, fuscis ($.025-.03 \times .008$ mm.).

On leaves of *Helonias bullata*.

No. 3199.

Although no asci were seen, this has been assumed to be a *Sphæria*.

Chætomium sphærospermum. C. & E.

Peritheciis superficialibus, atris, strigosis, in cæspitulis elongatis congestis, subglobosis; pilis rigidis, erectis, elongatis, tenuibus, atrobrunneis, supra divaricato-ramosis; sporidiis globosis, brunneis ($.01$ mm. diam.).

On bottom of barrel in cellar.

No. 3174.

BOTANY OF THE WEST.

One of the most valuable scientific reports which have appeared as the result of the U.S. Government Surveys of the Territories of the West is Dr. J. T. Rothrock's final report on the Botany of the survey under charge of Lieut. Geo. M. Wheeler. It is a quarto of over 400 pages of letter-press, accompanied by 30 plates and one wood cut.

The Doctor was very fortunate in securing the co-operation of such specialists as Mr. Serreno Watson, Dr. Engleman, Prof. Porter, Mr. Bebb, Mr. Booth, Dr. Vasey, Prof. Eaton, Mr. James, and Prof. Tuckerman, all authorities in their respective branches.

The portion of the report most interesting to the readers of "Grevillea" are those by Prof. Eaton, Mr. James, Mr. Austin, and Prof. Tuckerman.

In the report of Prof. Eaton, on the Ferns of the Southwest, "it has been thought best to give, not merely a report of such as have been collected by the survey under Lieut. Wheeler, but including these to make a full report of all the ferns discovered hitherto in the regions lying W. of the 105° W. Long. and S. of the 40° N. Lat. Since many of these species are described only in works which are inaccessible to most collectors and amateurs of ferns, it seems desirable to give reasonably full descriptions of all the species and genera which are not found in 'Gray's Manual,' and to even describe anew a few which are given in that work."

"The genera *Scolopendrium*, *Struthiopteris*, *Onoclea*, *Dicksonia*, *Schizaea*, *Lygodium*, and most remarkable of all *Osmunda*, have never been discovered in any part of the territory west of the

Rocky Mountains." In this report are comprised descriptions of 16 genera and 66 species. "It must remain for years the standard authority on the ferns of that wide area."

The mosses are described and determined by Mr Thomas P. James, of Cambridge, Mass., and include "several novelties not heretofore found in this country, and a few of rare species." This paper includes 42 genera and 79 species.

"The Hepaticæ," determined by Mr. C. F. Austen, consists of a list of 5 genera and 15 species.

"The Lichens," by Prof. Edward Tuckerman, comprises a catalogue of 16 genera and 28 species.

The last two papers contain no descriptions, but are mere catalogues, no new species having been detected by these cryptogamists.

The grasses were examined and reported on by Dr. Geo. Vasey; the Junceæ, Commelyneæ and Cyperaceæ, by Dr. Geo. Engleman; the Labiataæ, Scrophulariaceæ, Polemoniaceæ, Boraginaceæ and Polygonaceæ, by Prof. Thomas C. Porter; the Willows, by Mr. M. S. Bebb, of Ill.; and the Carices by Mr. Booth, of Boston.

Lieut. Wheeler, in transmitting this report to the Secretary of War, says, "The zeal and fidelity displayed by Dr. J. T. Rothrock, not only in the field, but in the preparation of his report, and in superintending the collection of other reports, are worthy of full commendation."

The "table of orders," &c., enumerates 104 orders, 637 genera, and 1,657 species. "As a rule only the plants collected by the various parties of this survey have been enumerated or described in this report."

W. C. S.

ON PENIOPHORA.

By M. C. COOKE.*

(WITH PLATES 122 TO 126).

The order *Auricularini* of Hymenomycetous Fungi contains two genera in the Friesian arrangement, under the names of *Stereum* and *Corticium*, on the structure of which a few observations may not be wholly out of place.

It is well known that Fries paid little or no attention to microscopic characters, and that his whole classification of the Hymenomycetes was limited to all which could be detected by the aid of a common lens. In these days of microscopic research, such a limit is scarcely satisfactory, and in these two genera there are some structural features which indicate that his arrangement is not altogether so perfect as it might have been had he brought the microscope to his aid.

* Read at the Meeting of the Woolhope Club, 1878.

The hymenium of some species of the genus *Stereum* of Fries, is so decidedly velvety, that he could scarce do other than associate them in a group or subgenus whilst he ignored the generic value of *Hymenochæte*, as applied to this group by Leveille.

In the "Annales des Sciences Naturelles," for 1846, Dr. Leveille proposed *Hymenochæte* as a genus in which he included certain species of *Thelephora*, *Stereum*, and *Corticium*, which had the hymenium studded with persistent rigid setæ. These he further described as simple elongated cells, having the form of little cones, bearing no resemblance whatever to basidia. In our own country, the Rev. M. J. Berkeley accepted this genus as one worthy of adoption, as did also some Continental mycologists, whilst others still reject it, without any good or substantial reason. It is certain that the character is a permanent one, and that, as far as our experience goes, is confined to the species in which it is habitually present. This appears to be a good and valid reason in its favour, but beyond this, and confirmatory of it, is the fact that there is a general natural affinity and harmony of the species, so that almost at a glance one is led to attribute a new or unknown species to this genus on the faith of general appearance.

In the species of *Stereum* the hymenium (except in these excluded species), is smooth, composed of basidia compactly arranged side by side, and of uniform height. There are no other cells present, except in one or two isolated cases, to be alluded to hereafter, and certainly no indication of suppressed or undeveloped setæ, as in *Hymenochæte*.

If, on the other hand, a section be cut through the hymenium of such a species as *Hymenochæte rubiginosa*, Lev. (*Stereum rubiginosum*, Fr.), elongated bright-brown setæ will be seen arising from the same stratum as the basidia, passing between them and rising above the surface, to a height at least equal to three or four times the length of the basidia. These setæ are simple cells, without any indication of septa, gradually attenuated upwards, and with the external surface entirely smooth.

In some species, as in *Hymenochæte rubiginosa*, the setæ are uniformly long and slender, whereas in others, as in *Hymenochæte tabacina*, Lev., they are shorter and thicker, and in *Hymenochæte pellicula*, Berk. & Br., very small and delicate, but in all the character is the same, though differing in size and proportions.

This much is known to all mycologists, and admitted even by those who will not accept Leveille's genus, against which no sound objection has yet been urged. There is nevertheless another form of hymenium which prevails in some species of *Corticium* and in one or two species of *Stereum*, which, if known, is not recognised. This form seems to bear just the same relationship to *Corticium* that *Hymenochæte* bears to *Stereum*. It may be illustrated by a very common and familiar species.

If a section be cut through the hymenium of *Corticium quercinum*, Fr., it will be seen that there are numerous bodies mixed

with the basidia, much larger, of a broadly fusiform shape, springing from the same stratum as the basidia, but extending far beyond them, above the surface of the hymenium, for at least half their length. These bodies are not of the nature of setæ, but are obtuse at the apex, hyaline, uncoloured, and externally rough with projecting warts, which cover the whole surface above the hymenium. In this form of hymenium we have the analogue of that which prevails in *Hymenochæte*, the variations being that the projecting bodies are broadly fusiform or lanceolate, and not setæform, are hyaline and not coloured, and are externally rough instead of smooth.

A second example of this same type of structure will be found in another species equally well known and common, *Corticium cinereum*, Fr., but the projecting bodies, or metuloids, as they might be termed, are shorter, still narrowed towards each extremity, and externally rough.

The same very distinct character will be found in the hymenium of *Stereum disciforme*, Fr., and also *Stereum papyrinum*, Mont., *Corticium aschistum*, Berk. & Curt., *Corticium carneum*, Berk. & Cooke, *Corticium lilacinum*, Berk. & Br., and *Corticium fumigatum*, Thuenen, which latter is only a form of *Corticium cinereum*, Fr.

All the arguments which could be adduced in favour of *Hymenochæte* would apply equally to the separation of these forms, under a distinct generic name, to which we have applied that of *PENIOPHORA*, in allusion to the shuttle shaped bodies shown to be peculiar to the hymenium. Should it not be considered advisable to adopt a new generic name for these abnormal species of *Stereum* and *Corticium*, they will at least have to be brought together into *Hymenochæte* as a subgenus, leaving to *Stereum* and *Corticium* only those species which have a naked hymenium.

There is still one other form which the hymenium assumes in two species distinct from either *Hymenochæte* or *Peniophora*. The type of this form is *Hymenochæte veluticeps*, Berk. & Curt., a species from Cuba, and the other less strongly developed species is *Hymenochæte crocicereas*, Berk. & Br., from Ceylon. In the former of these the hymenium is abundantly velvety, as its name indicates, but this does not proceed from simple setæ, such as we have described to exist in *Hymenochæte*, but from pointed tufts of slender flexuous septate hairs which seem to be continuations of the fibrous substance of the subhymenial tissue, carried through the hymenium, and adhering together in conical tufts at the surface. These tufts are double the length of the longest setæ in any known species of true *Hymenochæte*, and the septate hairs are quite of a different character. In the second species the same structure is found, but on a very much reduced scale, the compound conical tufts of septate hairs not exceeding in length the setæ of *Hymenochæte pellicula*, B. & Br., which has perhaps the shortest setæ of any known species.

If these two species are still retained in *Hymenochæte*, they must

be relegated to a subgenus, and the generic character modified ; or perhaps better still, constituted into a genus under the name of *Veluticeps*, as *Veluticeps Berkleyana* and *Veluticeps crociareas*.

With these observations, we may proceed to the enumeration of the species which we would include in the proposed new genus.

PENIOPHORA.* Cke.

Coriaceous, or sub-carnose, effused. Hymenium beset with short, rigid, uncoloured, rough, projecting cells (metuloids), which are attenuated upwards or subfusiform, and give to the surface a velvety appearance.

1. *Peniophora quercina*. (Fr.) Pl. 125, fig. 13.

Metuloids fusiform (about $\cdot 07 \times \cdot 012$ mm.). *Corticium quercinum*, Fr. "Hym. Eur.," 653.

Europe, &c.

2. *Peniophora papyrina*. (M) Pl. 124, fig. 9.

Metuloids shortly fusiform (about $\cdot 035 \times \cdot 012$ mm.). *Stereum papyrinum*, Mont. Syll., p. 178.

Australia, Ceylon, Brazil, &c.

3. *Peniophora Habgallæ*. (B. & Br.) Pl. 124, fig. 10.

Metuloids narrowly fusiform, attenuated and smooth above (about $\cdot 07\text{--}\cdot 08 \times \cdot 0125$ mm.). *Corticium Habgallæ*, B. & Br. "Journ. Linn. Soc." xiv., p. 72.

Ceylon.

4. *Peniophora aschista*. (B. & C.) Pl. 122, fig. 3.

Metuloids obclavate, smooth above, slender ($\cdot 08\text{--}\cdot 09 \times \cdot 008$ mm.). *Corticium aschistum*, B. & C., in "Grevillea" ii., p. 3.

United States.

5. *Peniophora Berkeleyi*. Cke. Pl. 122, fig. 4.

Metuloids obtusely conical (about $\cdot 04 \times \cdot 014$ mm.), *Corticium aschistum*, B. & C. (in part), in Herb. Berk.

Nicaragua.

6. *Peniophora lilacina*. (B. & Br.) Pl. 123, fig. 5.

Metuloids obclavate, obtuse (about $\cdot 06 \times \cdot 015\text{--}\cdot 018$ mm.), *Corticium lilacinum*, B. & Br., "Journ. Lin. Soc.," xiv., p. 70.

Ceylon.

7. *Peniophora disciformis*. (Fr.) Pl. 122, fig. 2.

Metuloids fusiform (about $\cdot 08 \times \cdot 015$ mm.) *Stereum disciforme*, Fr. "Hym. Eur.," p. 642.

Europe, &c.

8. *Peniophora cinerea*. (Fr.) Pl. 123, fig. 8.

Metuloids shortly and obtusely fusiform ($\cdot 03\text{--}\cdot 04 \times \cdot 01\text{--}\cdot 012$ mm.), *Corticium cinereum*, Fr. "Hym. Eur.," 654. *Corticium fumigatum*, Thüm. Myc. Un., No. 513.

Europe, &c.

9. *Peniophora tephra*. (B. & C.) Pl. 123, fig. 6.

Metuloids subconical ($\cdot 02\text{--}\cdot 025 \times \cdot 012\text{--}\cdot 014$ mm.), *Corticium tephrum*, B. & C., "Journ. Linn. Soc.," x., p. 336.

Cuba; Australia.

* From *πηφωρ*, a shuttle.

10. **Peniophora Ravenelii.** Cke. Pl. 124, fig. 12.

Metuloids obclavate ($\cdot 03\text{--}\cdot 035 \times \cdot 008\text{--}\cdot 01$ mm.), *Corticium auberianum*, Rav. No. 1369, not Montagne.

United States.

The true *Corticium auberianum*, Mont., is destitute of metuloids.

11. **Peniophora carnea.** (B. & Cke.) Pl. 124, fig. 11.

Metuloids obtusely fusiform ($\cdot 04 \times \cdot 012$ mm.), *Corticium carneum*, B. & Cke., in "Grevillea," vii., p. 1.

Texas; California.

12. **Peniophora Ayresii.** (Berk.) Pl. 122, fig. 1.

Metuloids broadly fusiform, very large ($\cdot 012 \times \cdot 02\text{--}\cdot 025$ mm.), *Corticium Ayresii*, Berk., in Herb.

Mauritius.

13. **Peniophora flavido-alba.** Cke. Pl. 125, fig. 14.

Effused, immarginate, pale sulphury-yellow, or pale ochre, even, cracking transversely in drying, rather thin. Metuloids elongated fusiform ($0\cdot 1 \times 0\cdot 15$ mm.).

On *Myrica cerifera* (Rav., 2529).

United States.

14. **Peniophora limitata.** (Fr.) Pl. 123, fig. 7.

Metuloids fusiform, small ($\cdot 025\text{--}\cdot 03 \times \cdot 008$), smooth above, *Corticium limitatum*, Fr. "Hym. Eur.," p. 656.

Europe.

15. **Peniophora velutina.** (Fr.) Pl. 125, fig. 15.

Metuloids scarcely rigid, fusiform ($\cdot 05\text{--}\cdot 06 \times \cdot 01$ mm.), *Corticium velutinum*, Fr. "Hym. Eur.," 650.

Europe.

Rather an aberrant form. The metuloids more resemble hairs than the bodies met with in other species.

16. **Peniophora sparsa.** (B. & Br.) Pl. 125, fig. 16.

Metuloids attenuated upwards, expanded, and often forked at the base ($\cdot 08 \times \cdot 01$ mm.), *Corticium sparsum*, B. & Br., "Journ. Linn. Soc.," xiv., p. 72.

Ceylon.

Another aberrant form.

In *Corticium ephesium*, B. & C., and two or three other species, there are projecting cells or basidia on the hymenium, but these have quite a different character from the bodies which we have termed metuloids.

FUNGI BRITANNICI EXSICCATI.

CENT. VII.

No.

601. *Polyporus sulphureus.* Fr.

602. *Polyporus Schweinitzii.* Fr.

603. *Polyporus spumosos.* Fr.

604. *Polyporus chioneus.* Fr.

605. *Polyporus abietinus.* Fr.

- No.
 606. *Trametes mollis*. *Fr.*
 607. *Corticium sulphureum*. *Fr.*
 608. *Tremellodon gelatinosum*. *Fr.*
 609. *Tremella albida*. *Huds.*
 610. *Tremella epigæa*. *Fr.*
 611. *Cantharellus lobatus*. *Fr.*
 612. *Hygrophorus foetens*. *Phil.*
 613. *Didymium squamulosum*. *Fr.*
 614. *Lycogala epidendrum*. *Fr.*
 615. *Trichia varia*. *Pers.*
 616. *Cyathus striatus*. *Hoffm.*
 617. *Septoria mori*. *Lev.*
 618. *Micropera drupacearum*. *Lev.*
 619. *Dichomera Saubinetii* (*Mont.*)
 620. *Diplodia lantanæ*. *Fckl.*
 621. *Diplodia ligustri*. *West.*
 622. *Diplodia salicina*. *Lev.*
 623. *Cytispora rubescens*. *Fr.*
 624. *Melanconium sphæroideum*. *Lk.*
 625. *Pestalozzia Guepiui*. *Desm.*
 626. *Cheirospora botryospora*. *Corda.*
 627. *Cryptosporium coronatum*. *Fckl.*
 628. *Myrothecium roridum*. *Tode.*
 629. *Torula graminum*. *Link.*
 630. *Torula herbarum*. *Link.*
 631. *Sporidesmium lepraria*. *B.*
 632. *Monilia hesperidea*. *Sacc.*
 633. *Puccinia millefolii*. *Fckl.*
 634. *Puccinia striola*. *Link.*
 635. *Puccinia glechomatis*. *D.C.*
 636. *Puccinia scirpi*. *Link.*
 637. *Uromyces scrophulariæ*. *Lib.* (=U. *concomitans*. *Berk.*)
 638. *Puccinia centaureæ*. *D.C.*
 639. *Puccinia lapsanæ*. *Fckl.*
 640. *Podisoma sabinæ*. *Fr.*
 641. *Macrosporium commune*. *Rabh.*
 642. *Helminthosporium stemphylioides*. *Corda.*
 643. *Sporotrichum resinæ*. *Fr.*
 644. *Zasmidium cellare*. *Fr.*
 645. *Peziza ammophila*. *DR. & M.*
 646. *Peziza firma*. *Pers.*
 647. *Peziza crucipila*. *C. & Ph.*
 648. *Peziza granulata*. *Bull.*
 649. *Peziza Adæ*. *Sadler.*
 650. *Peziza succosa*. *Berk.*
 651. *Peziza macrocystis*. *Cke.*
 652. *Peziza constellatio*. *B. & Br.*

No.

653. *Peziza benesuada*. *Tul.*
 654. *Peziza fusca*. *Pers.*
 655. *Peziza scirpi*. *Rabh.*
 656. *Patellaria rhabbarbarina*. *B. & Br.*
 657. *Ascobolus subfuscus*. *Boud.*
 658. *Bulgaria purpurea*. *Fckl.*
 659. *Cenangium cerasi*. *Fr.*
 660. *Dermatea Houghtoni*. *Phil.*
 661. *Stictis nivea*. *Pers.*
 662. *Hysterium pinastri*. *Schr.*
 663. *Labrella Ptarmicæ*. *Desm.*
 664. *Phacidium repandum*. *Fr.*
 665. *Hypocrea gelatinosa*. *Tode.*
 666. *Hypocrea rufa*. *Fr.*
 667. *Hypomyces torminosus*. *Tul.*
 668. *Isothea saligna*. *Fr.*
 669. *Melanconis stilbostoma*. *Tul.*
 670. *Diatrype strumella*. *Fr.*
 671. *Diatrype nucleata*. *Curr.*
 672. *Valsa Kunzei*. *Fr.*
 673. *Melogramma Bulliardi*. *Tul.*
 674. *Diatrype bullata*. *Fr.*
 675. *Entypa spinosa*. *Fr.*
 676. *Dichæna faginea*. *Fr.*
 677. *Valsa stellulata*. *Fr.*
 678. *Diaporthe quercina*. *Nke.*
 679. *Valsa Curreyi*. *Nke.*
 680. *Valsa pulchella*. *Pers.*
 681. *Sphæria pulveracea*. *Ehr.*
 682. *Sordaria curvula*, *var. aloides*. *Wint.*
 683. *Sordaria decipiens*. *Winter.*
 684. *Sphæria cirrhosa*. *Pers.*
 685. *Diaporthe aceris*. *Nke.*
 686. *Diaporthe epilobii*. *Fckl.*
 687. *Diaporthe pardalota*. *Mont.*
 688. *Sphæria rubella*. *P.*
 689. *Sphæria* (Pleospora) *Eleocharidis*.
 690. *Sphæria* (Pleospora) *aparines*. *Fckl.*
 691. *Sphæria* (Pleospora) *samaræ*. *Fckl.*
 692. *Pyrenophora trichostoma*. *Fr.*
 693. *Sphæria* (Pleospora) *herbarum*. *P.* On *Malva*.
 694. *Sphæria* (Pleospora) *herbarum*. *Pers.* On *Galium*.
 695. *Sphæria* (Pleospora) *herbarum*. *P.* On *Lucerne*.
 696. *Sphæria* (Pleospora) *herbarum*. *P.* On *Lapsana*.
 697. *Sphærella Taxi*. *Cke.*
 698. *Stigmatæa Alchemillæ*. *Grev.* (= *Venturia*.)
 699. *Sphæria* (Pleospora) *infectoria*. *Fckl.*
 700. *Sphærella peregrina*. *Cke.*

BRACHYTHECIUM SALEBROSUM. HOFFM.

The late Mr. G. Hunt, of Manchester, and myself, took some pains years ago to ascertain, if possible, the reality of veritable *B. salebrosum*, Hoffm., having been found in Britain, but we failed to get satisfactory evidence.

It is patent to all, even to amateur Bryologists as ourselves, that *B. glareosum*, Bruch., *B. mildeanum*, Schpr., and *B. compestre*, Bruch., have been successively regarded as forms of *B. salebrosum*, Hoffm.

Although I have strong doubts of the value of *B. mildeanum* as a distinct species from the lax forms of the variable true *B. salebrosum*, I leave to others to decide that knotty point.

I do not think many will dispute *B. glareosum* to rank as a truly distinct species—its long leaves, with twisted filiform points, separating it by an obvious character.

Now, the localities cited by Wilson, in his "Bryologia Britannica," 1855, p. 338, are for *B. salebrosum*, Loch of Forfar, Drummond; Castle Howard, Mr. Spruce; Sussex, Mr. Mitten.

On enquiring, Mr. Hunt found the evidence as to these first two was very shadowy, and Mr. Mitten has abandoned his Sussex habitat.

We have in Sussex *B. mildeanum*, *verum*, but extremely local, and only barren, in a narrow belt on the northern base of our chalk downs, and Mr. Mitten told me he had gathered the same on the coast west of Brighton.

Of the true specific value of Sussex forms of *B. campestre*, I can say nothing. My fertile plants Mr. Mitten pronounced identical with his; but Mr. Hunt regarded these as a rigid form of *B. mildeanum*; perhaps from growing principally on clay, and making the outline of the leaf an isosceles triangle, of which the base is one-third to one-fourth of its length.

On Ben Lawers, in Perthshire, in July, 1874, I gathered a cæspitose blackened *Brachythecium*, with somewhat incurved branches. I am indebted to Dr. Braithwaite for pointing out its identity with *B. salebrosum*, and he has it also from the same mountain. My plant occurred near Creag á Bhuic, on a shady rock, with *Weissia crispula* and *Pseudoleskea atrovirens*, and at an elevation of about 3,000 feet.

This Ben Lawers form is very near a plant I found last year on rocks close to Lac d'Espingo, in the Pyrenees, 6,152 feet. A locality given by Spruce for *Camptothecium aureum*, Lagasa, which I could not find. A singular habitat for *C. aureum*, a purely Southern plant, said to be abundant at Madrid, but one would not have supposed it should have been found at Lac d'Espingo, almost a glacial lake.

Brighton.

G. DAVIES.

EXPERIMENTS ON THE COLORIFIC PROPERTIES OF LICHENS.

By W. LAUDER LINDSAY, M.D., F.R.S.E., F.L.S.

The subject of the colours or colouring matters contained in, or educible from, Lichens—to which I directed attention about 25 years ago*—has recently re-acquired considerable interest or importance in connection with, or in relation to,

1. The Introduction of Colour-tests, *as characters for species* in Lichens ; †
2. The development of *fast dyes from Lichens*, capable of competing successfully with the coal tar and other recent products of the chemist's laboratory ; ‡ and
3. The continued domestic use of Lichens as Dye-stuffs in our own country. §

So long ago as 1853, ¶ in connection with an experimental inquiry on the economical applications of the Lichen-dyes, I pointed out the extreme unsatisfactoriness of our knowledge of the *Chemistry* of these dyes ; and the progress of science in this direction has not since been such as to enable me to modify the strong opinion then expressed. ¶ During the last 25 years the principal changes in our knowledge of the chemistry of these colouring matters consist in—(1) the addition of sundry (supposed or really) new substances, which addition confuses to a still greater degree the previous confusion of *names* ; and (2) certain proofs of the correctness of an opinion I was long ago led to hazard, that several, at least, of the bodies described by different chemists as differing trivially in constitution or characters, would prove to be referable to the same substance.** I have more than once pointed out the necessity that exists for a *new* series of researches on the chemistry of the Lichen-colouring matters, to be undertaken conjointly by

* "Experimental Researches on the Tinctorial Properties of Lichens." Proceedings of Botanical Society of Edinburgh, 1853-4-5 ; "North British Agriculturist," 1853-4 ; "Phytologist," 1853-4 ; "Edinburgh New Philosophical Journal," 1854-5.

† "Chemical Reaction as a Specific character in Lichens." "Journal of Linnean Society, Botany," vol. xi, p. 36

‡ "Present uses of Lichens as Dye-stuffs." Report of British Association, 1867 ; Transactions of Sections, p. 40 ; Seemann's "Journal of Botany," vol. vi (1868), p. 101.

§ "Present domestic use of Lichen Dye-stuffs in the Scottish Islands and Highlands." Seemann's "Journal of Botany," vol. vi. (1868), p. 84.

¶ "Phytologist." Vol. iv. (1854), p. 905.

¶ "Lichen Dyes." Hardwicke's "Science Gossip," December, 1867, p. 266 ; and paper on "Present uses of Lichens as Dye-stuffs" (*supra* citat).

** In his latest contribution to Lichen-Chemistry, Stenhouse ("On some Varieties of Orchella Weed and the products obtained from them"—"Journal of the Chemical Society," May, 1867) admits that his *Erythric* acid is the same as Schunck's *Lecanoric* acid.

competent chemists and lichenologists. Not only are *new* fields of research open, but the need of a *revision* of all previous analyses is even more evident. Chemists themselves are forced to make this admission;* but the subject of the Chemistry of the Lichens has not as yet proved a sufficient counter-attraction to the innumerable other interesting problems that are daily being exposed for solution in the wide domain of organic chemistry. Meanwhile, the crude researches of lichenologists may serve to pave the way for the subsequent more scientific and precise analyses of chemists, by indicating the *directions* in which chemical inquiry is likely to prove useful or successful. Quite recently, moreover, a strong opinion as to the utility of researches on the Lichen colouring matters—of the character of those formerly published by myself—has been expressed by the highest living authority on the subject of general Lichenology, viz., Von Kemptelhuber, of Munich;† while, in the long interval that has elapsed since the publication of my first series of researches, no other experimentalist has occupied the same wide field.

The foregoing along with other considerations induce me to submit the results of another more systematic and complete series of experiments, supplementary to those presented in 1853-4-5. These results include, or consist of, a general inquiry into colour-development or colorific property in the whole family of Lichens. The experiments in question are on the one hand a repetition, and on the other an extension, of my former series of experiments,‡ and illustrate generally the *colour-reactions* of Lichens. The results given are mainly those which are *positive*; they represent only a proportion of several hundred experiments, the majority of which led to no colour-reaction at all. In the present series of experiments I used a *solution* of the Lichen colorific principles or colouring matters in hot water or alcohol—boiling the Lichens, previously reduced to powder or minute fragments. My reason was that the majority, at least, of the said colorific or colouring principles or matters, while insoluble in cold and sparingly so in hot water, are readily soluble in cold or boiling *alcohol*.§ The reactions developed are thus the effects of re-agents on the *alcoholic or aqueous decoctions of the Lichen-thallus*.

In order to secure something like uniformity, if not precision, in the *nomenclature of the colours* obtained, I carefully compared them with the colour-specimens published in the little work of Syme (in

* Thus Professor Crum-Brown, of Edinburgh, to whom I proposed a joint *new* experimental inquiry, wrote me in Jan., 1867, "There is still . . . room for much further work."

† "Geschichte und Litteratur der Lichenologie" (1867), p. 423-4.

‡ "Phytologist," vol. iv. (1853), p. 1068.

§ This fact, the result of chemical research, is sufficient of itself to throw doubt on the possibility of properly educing colour-reaction by the mere application to the Lichen-thallus, or apothecium, of a drop of bleaching solution or liquor potassæ! *Vide* paper on "Chemical Reaction as a Specific Character" (*ob. cit.*).

connection with the once celebrated nomenclature of *Werner*), and in many cases I have added to my own nomenclature what appeared to me to be its equivalent in *Werner's* system. I have not deemed it necessary, for present purposes, to follow *Westring's* example and give *specimens* of the colours obtained. The fugitive* character, of at least many, of the Lichen-colouring matters renders it doubtful whether, for any purposes, such a series of samples can give an adequate idea of their brilliancy.

With a view further to secure a fixed standard of comparison—to obtain authenticity and uniformity of nomenclature in the Lichens operated on, I have used as the basis of my experiments in great measure the specimens contained in the published fasciculi of *Mongeot* and *Nestler* (Vosges district of France, published between 1810 and 1850), and of *Schärer* (Switzerland, published between 1823 and 1852). These specimens, it is to be observed, are therefore comparatively *old*. But I have occasionally made parallel series of experiments on *fresh* Lichens in their own places of growth, with, on the whole, similar results. Thus, while travelling in New Zealand in 1861—with a view to test their comparative colorific capabilities—I submitted to experiment on the small scale 15 Otago lichens from various localities in that province, belonging to the following cosmopolite species, on British and European specimens whereof I had, in former years, similarly experimented at home, viz., *Lecanora parella*, *Parmelia saxatilis*, *P. perlata*, and *P. perforata*. The testing process here was simple ammoniacal maceration, but under disadvantageous conditions. The experiments were conducted in small *corked* phials; due access of oxygen was thus prevented; and without free access of this gas—as contained in atmospheric air—the full development of colour cannot occur. Nevertheless, within generally two or three days, colours were obtained of similar kind and richness to those procured from the same species of Lichens at home.† I may add that other experimentalists, operating in the same simple and rudimentary way in other countries, appear to have ob-

* This may be judged of by an inspection of the suites of *Illustrations of Lichen-dyes* contained in the Museums of Economic Botany of Edinburgh or Kew, or the Museum of Science and Art, Edinburgh.

† The suite of colour-specimens so manufactured—with a parallel series of British samples—under the designation of “*Illustrations of Lichen-dyes*,” was handed over to the New Zealand Exhibition of 1865 at Dunedin (Sect. 1, Class 4). My object was to assist in stimulating the colonists to devote some attention to the development of the industrial resources of their adopted country—to the utilization of the vegetable products of their own province. I was strongly of opinion, moreover, that such a Colonial Exhibition at so early a stage in the history of the colony was calculated to be of immense benefit in hastening and helping its substantial prosperity. It was with pleasure, therefore that I further contributed to the said Exhibition, suites of

I. *Fibres*, which might be substituted for current materials in the manufacture of paper, cordage, carpeting, or other textile fabrics; and

II. *Dyes* produced from the common native weeds of Scotland.

tained similar results. Thus a correspondent in Montreal (Mr. A. T. Drummond) wrote me, in September, 1869, as follows:—“*Parmelia Borreri*, which is very common on trees, rails and gneiss, yields on ammoniacal maceration a purple dye. The *Umbilicarias*, which are frequent among the Laurentian rocks, yield red by the same process.”

[The foregoing is but a brief introduction to a voluminous series of elaborate tables of details of experiment, which it is not necessary, even were it easy, to publish in “*Grevillea*.”]

NEW BRITISH LICHENS.

Communicated by the REV. J. M. CROMBIE, F.L.S.

The following interesting discoveries by Mr. Larbalestier in N.W. Ireland, have recently been recorded by Dr. Nylander in the “*Flora*,” 1879, pp. 201-207, and 220-224:—

1. ***Lecanora umbraticula*.** *Nyl.*—Thallus greenish, thin, subleprose; apothecia carneo-luteous or subluteous, somewhat plane, biatorine, whitish within; spores 8 μ , fusiform, usually simple, sometimes thinly 1-septate, 0.008-16 mm. long, 0.002-3 mm. thick; paraphyses submoderate, epithecium and hypothecium colourless. Hymenial gelatine, wine-red with iodine.

On shady calcareous rocks. Kylemore, Galway. Closely allied to *L. albocarnea*.

2. ***Lecidea alborubella*.** *Nyl.*—Thallus whitish or greenish-white, very thin or evanescent; apothecia yellow or reddish flesh-coloured, somewhat convex, immarginate, colourless within; spores 8 μ , bacilliform or fusiformi-bacillar, 3-septate, 0.014-21 mm. long, 0.002 mm. thick, paraphyses slender, epithecium and hypothecium colourless. Hymenial gelatine, tawny wine-red with iodine.

On calcareous rocks. Kylemore. A peculiar species, belonging to the section of *Lecidea bacillifera*. Nylander observes that hymenicolle gonidia are sometimes present, as is the case with other *Lecideas*.

3. ***Lecidea byssoboliza*.** *Nyl.*—Thallus greenish or greyish-green, opaque, very thin, continuous, indeterminate; apothecia carneo-luteous, somewhat prominent, the margin at length undulated (paler or scarcely distinct), colourless within; the base externally circumpubescent (radiating), with a shortish white byssus; spores 8 μ , fusiform, 3-5 septate, 0.023-27 mm. long, 0.003-4 mm. thick, paraphyses slender, epithecium and hypothecium colourless. Hymenial gelatine, pale-bluish, and then tawny wine-coloured with iodine.

On calcareous and schistose rocks in a cave at Kylemore. Belongs probably to the section of *L. cupreorosella*, but the spermogones not seen.

4. **Lecidea alabastrites.** *Nyl.*—Thallus whitish or greenish-white, very thin, continuous or thin, minutely subgranulose; apothecia whitish, somewhat plane, margined (the margin scarcely prominent, obsoletely paler), colourless within; spores 8 μ , fusiform, 3.5 septate, 0.018-24 μ long, 0.005-7 μ thick, paraphyses not discrete, epithecium and hypothecium colourless. Hymenial gelatine, bluish with iodine, and then (especially the thecæ) dark wine-coloured.

Amongst mosses on the bark of trees at Kylemore. Allied to *L. sphaeroides*.

5. **Lecidea perustula.** *Nyl.* *—Thallus pale, minutely areolate, areolæ plane, innate, somewhat scattered on a black thin hypothallus, which is at length minutely areolato-rimose, smooth, determinate; apothecia black, innate, somewhat plane; spores 8 μ , colourless, oblongo-ellipsoid, 0.006-8 μ long, 0.003 μ thick, paraphyses not very well discrete, epithecium bluish-brown, hypothecium brown. Hymenial gelatine, at first slightly bluish and then tawny wine-red with iodine.

On siliceous rocks. Kylemore. A minute species, belonging to the section of *L. fumosa*.

6. **Chiodecton subdiscordans.** *Nyl.*—Thallus whitish, thin, subgranuloso-continuous; apothecia black, simple or at length divided, on pulvinato-plane, rotundato-oblong, or subdeformed stromata; spores 8 μ , oblong, 3-septate, 0.011-16 μ long, 0.0035 μ thick (thicker at the upper apex), paraphyses not distinct, epithecium somewhat blackish, hypothecium blackish. Hymenial gelatine bluish, and then sordid yellow with iodine.

On moist rocks, near Kylemore. A very peculiar and distinct species, most nearly allied to the American *Ch. separatum*, *Nyl.*

7. **Arthonia subexcedens.** *Nyl.*—Allied to *A. complanata*, Fée, and scarcely differing except in the constantly rather larger spores; spores oblongo-oviform, 5-6 septate, 0.025-32 μ long, 0.009-12 μ thick, and at length often brownish; spermatia acicular, straight, 0.007 μ long, 0.0005 μ thick.

On the bark of holly, near Kylemore. Perhaps only a subspecies of *A. complanata*.

8. **Verrucaria conturmatula.** *Nyl.*—Thallus greyish, maculate; apothecia minute, depressed, subconfluent, the pyrenium dimidiate, black; spores 8 μ , ellipsoid or oviform-ellipsoid (sometimes obsoletely 1-septate), 0.011-14 μ long, 0.005-6 μ thick, paraphyses none. Hymenial gelatine, wine-reddish with iodine.

On quartzose stones in a rivulet at Kylemore, associated with

* This has since been ascertained to be *Lecidea macula*, Tayl., in "Fl. Hib.," which consequently has priority.

Lecanora lacustris. A peculiar species, comparable with *V. discreta*, Mtl.

In addition to the above, Nylander, in his appended observations, remarks also on some other British Lichens, as follows :—

1. ***Lecidea delutula***. *Nyl.*—This agrees in the structure and spores with *L. Arnoldi* (Kphb.), of which it may be a sub-species, but the thallus is greyish-green, very thin (at length rimose), the apothecia pale carneo-luteous, subbinate, usually gyalectoid; spores 0·012-16 mm. long, 0·004-5 mm. thick.

On moist siliceous ferruginous rocks. Klymore.

2. ***Lecidea thiopsona***. *Nyl.*—In “Flora,” 1876, p. 573. This is only a form of *L. pulvinata*, Tayl., with the thallus somewhat sulphureous.

3. ***Opegrapha hysteriiformis***. *Nyl.*—This is scarcely more than a larger form of *Op. atrula*, *Nyl.*, in “Flora,” 1877, p. 565.

On schistose rocks. Klymore.

4. ***Opegrapha saxigena* f. *clarescens***. *Nyl.*—Thallus whitish or greenish-white, very thin, continuous, apothecia usually smaller than in the type.

On rocks. Klymore (Larbalestier); also in Appin (Crombie), 1876.

5. ***Verrucaria prominula** *viridans***. *Nyl.*—Thallus pale or greenish, thin, continuous, subrimulose; spores 0·010-12 mm. long, 0·007-9 mm. thick.

On maritime rocks, near Klymore.

VITRICOLE LICHENS AND THE SCHWENDENERIAN HYPOTHESIS.

In the “Flora,” 1879, pp. 303-4, Dr. Nylander has a note upon Vitricole Lichens, from which we give the following extract, which bears directly upon Schwendenerianism, and will, no doubt, be interesting to the readers of “Grevillea,” under whose notice the subject in other aspects has recently been so lucidly brought by the Editor.

“After observing that he had already in the ‘Flora,’ 1877, p. 356, and 1878, p. 247, stated that it was useless to study the germinations of Lichens from spores cultivated at home,* because in Nature itself not only the earliest stages of these germinations, but also the whole development of Lichens can readily be perceived on quartzose rocks and smooth bark of trees,† Nylander proceeds to notice that the same may still more easily be observed on glass which has been exposed for a long series of years in districts where Lichens are of common occurrence. “There, in the very pure sur-

* *Vide* also Cromb. in “Pop. Sc. Rev.,” 1874, pp. 267-8.

† To this also may be added, on mortar of walls and houses, as in the suburbs of London.—J. M. C.

face of the glass, we have, under the microscope before our eyes, numerous germinations and prothalline formations, and then gradually advancing the beginnings of the primary glomeruli of the thallus (as are sufficiently well figured in 'Tul. Mem. Lich.,' t. 3, f. 3), and behold the whole process of evolution from the germinating spore to the perfect thallus, and at length to the formation of the perfect apothecium. All of these are seen to be formed of themselves—that is, by an innate power or impulsion of procreation, which is inherent in the spore, the only aiding materials being those lent by the atmosphere, especially rain water. Upon the very pure glassy substratum where these vital phenomena go on; no trace of any *Protococcus* (or *Pleurococcus*) nor of any element of a heterogenous thallus is detected in the vicinity, although we have examined innumerable examples of such germinations in very favourable circumstances, especially in *Lecanora galactina*, Ach., *Lecanora exigua*, Ach., and *Lecidea alboatra* (Hoffm.), growing upon glass. The prothalline commencements of *Lecanora exigua* radiate dendritically around the spores, and are of a blackish colour, forming the hypothallus, in which minute cellulose thalline glomeruli are produced, presently exhibiting gonidia forming themselves in the cells (as in 'Tul. Mem.,' l.c.); often also we see apothecia produced even in a very young plant. The same is the case with the beginnings of *Lecanora galactina*;* but here the hypothallus is white, consisting of white byssine appressed filaments, laterally apposite and contiguous. All these hypothalli are very closely agglutinated to the glass; and there are no traces whatever of any *Protococci* in connection with them."

These observations of themselves, in connection with Vitricole Lichens (which, in this country, we have only observed on broken pieces of bottles on garden wall tops, chiefly in Scotland), are amply sufficient to show how untenable is the Schwendenerian hypothesis, which, in the concluding words of Nylander's paper, is thus "reduced to the nothingness from which it ought never to have emerged."

J. M. CROMBIE.

PREPARATIONS OF LICHENS.

If the Schwendener theory of the dual nature of Lichens has done no other service, it has at least been the means of attracting attention to a sorely neglected group of cryptogamic plants, concerning which the majority, even of educated persons, were in profound ignorance. Like all other branches of Natural History, Lichens, as now understood through the medium of our improved microscopes, are very different to what they were fifty years ago. There are also other reasons which have given Lichenology an impetus forward in Britain, and chiefly the increased facilities for

* This I can entirely corroborate from my own observations on this species, as growing on mortar in the north suburbs of London.—J. M. C.

the pursuit of the study. Admirable sets of specimens, carefully determined by highly competent authorities, have been issued, and an excellent Lichen Flora has reached its third edition. That such a special scientific volume as Leighton's Lichen Flora should have reached a third edition, is a welcome surprise, and is, in itself, an evidence that the study of Lichenology must be extending. Another important aid to the prosecution of this study was noticed in our last number, which we advert to again, namely, the issue by Mr. W. Joshua, of Cirencester, of a series of microscopical mountings of Lichens, some of which it has now been our privilege to examine. There are three requisites which we contend that such a series should possess to ensure their complete success. They should be critically accurate in their determination. The series should be a thoroughly representative one, containing all the principal types; and the parts of such specimens selected for mounting should be those which are essential for educational purposes. To these we might add a fourth in the suggestion that the manipulation should be unimpeachable. As far as we have seen, we have every reason to believe that this series to which we allude, fulfils all these four conditions. Mr. Joshua is an old and experienced Lichenologist, enjoying the friendship and counsel of the best Lichenologists in the kingdom, and hence there is no room for doubt of the first condition being fulfilled. The list which we published of the species illustrated in the first portion of the series, will afford ample proof how the second condition is in course of fulfilment. An examination of some of the "slides" already issued, enable us to testify that the third and fourth conditions are satisfied as fully as the first and second. We have doubts whether any biologist can sit down to such mountings as those of *Lichina pygmaea*, *Pyrenopsis granatina*, *Collema biatorinam*, *Collema multipartitum* and *Omphalaria pulvinata*, without profound interest, and deep thoughtfulness being produced by their examination. Of course the dual hypothesis will come into one's mind, but thoughts and reflections far higher than such an hypothesis will soon crowd that into the background.

There are, perhaps, three classes of individuals to whom these preparations will be welcome. There are the Lichenologists, or those ambitious of becoming such, who would study them as illustrations of genera and species, and they will be glad to have just what they require prepared for their use, without all the labour and the many failures of inexperience, perhaps, or at least without a great expenditure of time necessary to make such preparations. Then there are the general students of biology, who are neither mycologists or lichenologists, but who desire to see and learn something of the structure of all the lower orders of plants. Of course such persons will have to depend for their best help on such series as the present, and those of a kindred nature in other orders. Finally, there are the curious, who want to see and possess new objects, rare, beautiful, and true. To them it matters little what they are called, so long as they are curious, or beautiful, or

rare, or illustrative of some subject which has been under conversation or controversy in scientific circles. If we mistake not, here is material to satisfy the requirements of these three classes, and we are very much mistaken if the most decided *dilettante* does not discover that the sections of Lichens which heretofore were only to him an empty name, are such marvellous and interesting pages in the book of life, that some of the lines will become imprinted upon his brain for ever.

THE LICHEN-FLORA OF GREAT BRITAIN, IRELAND, AND THE CHANNEL ISLANDS.*

Whether the highly fanciful views of Schwendener, Bornet, and other investigators, which reduce all Lichens to parasitic Fungi, preying on stray Algæ, and represent them as performing feats of capture and voraciousness, best illustrated by members of the animal kingdom, be accepted or not, this book on British Lichens will be found indispensable to the student of these plants. Lichens remain Lichens, in spite of this incongruous theory, presenting as distinct an individuality as is seen in any other branch of the vegetable kingdom, and will continue to offer a deeply interesting field of investigation to the Cryptogamic botanist. The rapid strides in the advance of science in this country, made within the last half-century, is nowhere more conspicuous than in the department of which this work treats. In the fifth volume of "English Flora," published in 1833, the whole of the known British species of Lichens numbered 413, whereas in this work of Mr. Leighton they number 1,133, exclusive of the forms and varieties. When we consider what a comparatively small proportion of the botanists of Britain have given attention to these humble plants, this progress is very surprising. Nor is it to be supposed the field is exhausted. Treasures doubtless remain to reward the industry of future students. Some of the oldest living botanists, who imagined they had exhausted the British Lichen Flora, and turned their attention to other classes of plants, view, with a certain degree of impatience, the multiplication of new species, and would throw doubt on their value; but this must be attributed to the vexation of being left behind, as will inevitably happen if we stand still, by the advancement of science. We have, in Mr. Leighton's new work, a complete diagnosis of the 1,133 species, also of the varieties and forms of these, which make a total of 1,718. A new feature in this edition is the microscopic measurement of the spores. Notwithstanding the great variation in the size of spores in the same species, carefully taken measurements afford valuable help in determining a plant, for this variation is

* Rev. W. A. Leighton. Third edition. Shrewsbury, 1879.

usually within certain fixed limits. The perfection to which modern microscopes have been brought, renders the process of measurement comparatively easy. In the work before us the late Mr. Mudd's measurements by the fractions of an inch are quoted, but these will require careful comparison with those of Nylander, Fries, jun., and the author's own. It is much to be regretted that English workers do not adopt the millimetre in preference to the inch, as it is universally used on the Continent, and takes up less room when written. It is impossible, in a brief notice such as our space confines us to here, to point out all the valuable features of this work, but we may say, in conclusion, that references are given under each species to published figures of it, and to exsiccata in which it occurs; its geographical distribution, with the localities where it has been found, and the names of those who have found it are specified. Chemical reactions are indicated by fixed symbols, explained fully in the introduction. A glossary of terms used, together with a copious index, render this work as complete as can be desired, and we wish it every possible success.

UNDESCRIBED FUNGI IN THE KEW HERBARIUM.

By M. C. COOKE.

Ustilago australis. Cke.

Sporis atris, in germenibus enatis, subglobosis vel angulatis et difformibus, lævibus. (·008-·009 mm. diam.).

In ovaries of *Eriachne*. Australia. (Muller.)

Professor Fischer de Waldheim is of opinion that this is clearly distinct from any described species, and *not* a *Tilletia*, which in habit it resembles.

Puccinia sclerotioidea. Cke.

Amphigena. Soris atro-purpureis, epidermide cinctis, compactis, durissimis. Pseudosporis clavatis, constrictis, læte brunneis, episporio supra incrassato (·045 × ·015 mm.). Pedicellis persistentibus, hyalinis.

On leaves (probably some *Statice*). British Columbia. (Dr. Lyell.)

Puccinia Barbareæ. Cke.

Gregaria, amphigena. Soris rotundatis, atris, epidermide cinctis. Pseudosporis late lanceolatis, forte constrictis, læte brunneis, lævibus (·05 × ·016 mm.), episporio supra incrassatis. Pedicellis hyalinis, subpersistentibus.

In company with *Æcidium barbareæ*, D.C., on cruciferous plant. Oregon. (Dr. Lyall, 61.)

Corynelia tripos. Cke.

Cœspitose-gregaria, insidens stromate lineari convexo-nigro. Peritheciis atris, supra attenuatis, dein apice incrassato-truncatis.

Ascis ovatis, longe stipitatis. Sporidiis triradiatis, brunneis (limbo $\cdot 012 \times \cdot 003$ mm.).

On *Podocarpus elongatus*, and *P. Thunbergii*. Cape.

Most distinct from *C. uberata*, Fr., which has globose sporidia.

Dothidea Halepensis. *Cke.*

Follicola, atra, prominula, convexa, lævis, cellulis paucis. Ascis ovatis. Sporidiis ellipticis, uniseptatis, fuscis ($\cdot 014 \times \cdot 005$ mm.).

On leaves of *Pinus halepensis*. France.

Valsa Burchelli. *Cke.*

Pustulis tectis, erumpentibus; peritheciis atris (6-10), superne attenuatis, convergentibus, nigro-limitatis. Ascis clavatis. Sporidiis fusiformibus, hyalinis, 5-7 septatis, hinc illic cellulis divisis, ($\cdot 045 \times \cdot 01\text{--}\cdot 012$ mm.). Microstylosporis linearibus, curvulis ($\cdot 01$ mm. long).

On branches. Brazil. (Burchell, No. 2390.)

Sphæria (Cortocolæ) Peruviana. *Cke.*

Sparsa, tecta. Peritheciis atris, subdepressis, minimis. Ascis pyriformibus. Sporidiis congestis, inordinatis, hyalinis, ellipticis, triseptatis ($\cdot 015 \times \cdot 006$ mm.).

On twigs of grape vine. Peru.

ON SPHÆRIA QUERCUM. Schwz.

Mr. J. B. Ellis has recently published a note in the "Proceedings of the Academy of Natural Sciences of Philadelphia," in which he claims to have established the fact that all the following species are forms of the same fungus, *i.e.* :—

Sphæria quercum. Schwz.

Sphæria mutila. *Rav. F. Car.* iii. 62.

Sphæria ambigua. Schwz.

Sphærie Meliæ. Schwz.

Sphæria entaxia. *C. & E.*

Sphæria eriostega. *C. & E.*

Sphæria viscosa. *C. & E.*

Sphæria erratica. *C. & E.*

Sphæria thyoidea. *C. & E.*

Sphæria pyriospora. Ellis.

Botryosphæria pustulata. Sacc.

Dothidea venenata. *C. & E.*

Dothidea cerasi. *C. & E.*

Thumenia Wisteriæ. Rehm.

Sphæria Hibisci. Schw.

Sphæria Persimmons. Schw.

Sphæria Cratægi. Schw.

Valsa mahaleb. *C. & E.*

Melogramma Aceris. *C. & E.*

Sphæria fuliginosa. *M. & N.*

And having reduced all these to the rank of synonyms, he proposes to adopt the name of *Melogramma fuliginosum*, Ellis, to represent the *olla podrida*.

The process by which this curious consummation has been arrived at will be historically interesting, when even *Melogramma fuliginosum* is forgotten. It seems that all *external* features are discarded as unreliable, and all variations of internal structure ignored. The residue constitutes the diagnosis. It is assumed, however, that as the external is so exceedingly variable, as undoubtedly it would be in the above-named twenty species, the sporidia are to be the crucial test, and these being large and elliptical, will be the only real specific character in the new *Melogramma fuliginosum*. It matters not that they vary in size and form, that in some they should be obtuse, in others rather acute at the extremities, in some hyaline, in others deep brown. We are asked to accept this in all faith, and believe, in opposition to our prejudiced vision, that *Melogramma fuliginosum* is the type of a new process of species manufacture, by means of which any twenty or more so-called species may be rolled into one, provided the sporidia are nearly of the same size (colour not provided for in the patent). It would serve no useful purpose to enter upon a minute analysis of the synonyms quoted above, in order to refute a hasty note of this kind. There was probably some ground for believing that *all* the twenty species which are condemned were not equally sound, but that is no excuse for rushing to an extreme and condemning *all* to oblivion. Besides, upon what grounds were twenty other species excluded which have similar sporidia? surely they must have been known to the author. We can only regret that Mr. Ellis was so impolitic as to commit his conclusions to print. That an aspirant for scientific honour should have done so was simply an act of premeditated suicide.

SPEGAZZINI'S DECADES MYCOLOGIÆ ITALICÆ.

The original proposal of Sig. Spegazzini was to supply a limited number of small sets of dried specimens of Italian Fungi, as were new or rare, and which were not found in sufficient quantity for more pretentious exsiccati. For these select and valuable specimens a high price was demanded, but as the specimens were promised to be of a peculiar kind, few and good, this was a question of little moment. Six decades have now been issued, and we must confess them to be a lamentable satire upon the prospectus. The last three decades contain such rare species as *Puccinia anemones* P., *Trametes rubescens* Fr., *Uromyces Scrophulariæ* Lasch, *Æcidium Viola*, Sch., *Peronospora densa* D. By., *Cystopus cubicus*, Str., *Sphærotheca Castagnei*, Lev., *Leptosphæria acuta*, M. and N. *Hysterium angustatum*, A. & S., *Acrospermum graminum*, Lib., *Lophodermium pinastri*, Chev., *Heterosphæria patella*, Tode, *Sordaria coprophila* Not. The remaining of the thirty numbers contain eight

new or rare species, such as should have constituted the entire thirty. It is a very unthankful office to remind persons of their promises, and to claim their fulfilment, but the vendors of scientific specimens are assumed to be gentlemen of education, superior to the advertising subterfuges of a petty tradesman, or the questionable morality of an ordinary draper's assistant.

ANNUAL CRYPTOGAMIC MEETINGS.

The Fungus Foray of the Woolhope Club is fixed to take place at Hereford, on Thursday, the 2nd October, and the gathering of Mycologists will, as usual, commence on the previous Monday.

The Cryptogamic Society of Scotland is advertised to meet during the previous week at Forres, commencing on the 26th September. There is to be no "show" this year, but excursions will be organised to scour the neighbourhood for Fungi.

By the way, we believe that we may state that the long promised *Mycologia Scotica* is gone to press, and that there is every prospect of its appearance this autumn.

As to the Botanical Society of France, we have not, up to the present, received any intimation of a Mycological Session being held this year. Our French friends are by no means so persistent in their Annual Meeting as the English and Scotch Mycologists. This is to be regretted, for undoubtedly such gatherings have a stimulating influence, which can scarce be compensated in any other way.

NEW FUNGI OF THE JURA.

By Dr. L. QUELET.

***Peziza (Cupulares) irina.* Q.**

Cœrulea, violascens, crateriformis (2-4 cm.), inferne in stipito brevi albedo attenuata. Ascis cylindraccis. Sporidiis ellipticis, (0.15×0.06 mm.) asperatis. *Peziza violacea*, Quelet, Jura et Vosges, iii., p. 120.

Ad terram in foliis emortuis.

***Peziza (Dasyscypha) grandinea.* Q.**

Granuliformis (1 mm.), turbinata, costata, lanosa, nivea. Hymenio concavo albo. Sporidia bacillari (0.13 mm.) 5-guttulata. In cortice *Populi*. Jura.

***Peziza (Mollisia) cœrulans.* Q.**

Molli, expanso-applanata, cinerea. Hymenio griseo-cœruleo, margine albello. Sporidia aciculari (0.1 mm.) incurvata.

Confluens in *Eupatorio cannabinio*.

N.B.—Apparently scarcely distinct from *Peziza cinerea*, except in its habitat. But I am strongly of opinion that the true *Peziza cinerea* is confined to wood, and bark, and never occurs on herbaceous stems.—M. C. C.

***Peziza (Mollisia) Rozei.* Q.**

Punctiformi (·03 mm.), gibbosa, lobulata, granulosa, glabra, molli, ex aurantio-incarnata roseola. Sporidia ellipsoidea (·005 mm. long), deinde fusiformi et guttulata.

In caulibus emortuis, *Hellebori fetidi*.

***Peziza (Mollisia) succinea.* Q.**

Punctiformis, sessilis, succinea (·05-·007 mm.), glabra, subdiaphana, cupuliformis. Ascis subclavatis. Sporidiis linearibus, minimis.

In lignis cariosis.

***Peziza (Hymenoscypha) equisetina.* Q.**

Cupula plana (·05-·8 mm.), tenui, tenera, glabra, luteo-alba, stipite brevi (·05 mm.), tenui lutescente, concolore. Hymenio luteo, nitidulo. Sporidia bacillari (·005-·6 mm.).

In *Equiseto limoso*.

***Peziza (Hymenoscypha) tenuissima.* Q.**

Pusilla, stipitata, albida (0·1-0·5 mm.); stipite tenuissimo, glabro. Margine tenuiter hyalino-floccoso. Ascis cylindraceis. Sporidiis linearibus, ·005-·007 × ·001 mm. Paraphysibus fusiformibus, acutis.

In foliis, culmisque graminum.

***Epichlœ virescens.* Q.**

Peritheciis membranaceis, conico-pyriformibus (·1-2 mm.), e citrino-virentibus olivaceis, in tomentulo concolore nidulantibus. Nucleo hyalino. Sporidia aciculari, capillari (·05 mm.), multi-septata. *Acrospermum stromaticum*, Cooke in litt.

Sicut mucedo in *Sphæria moriformi*.

N.B.—From an examination of specimen, I am still of opinion that this is an *Acrospermum*, and by no means an *Epichlœ*, if genera are verities, and not mere names.—M. C. C.

PREPARATIONS OF ALGÆ.

We have referred on a previous occasion to the excellent preparations of Fungi for the microscope, made by the Rev. J. E. Vize. We have now had the opportunity of inspecting a series of mountings of Algæ, which have been prepared by the same gentleman, and are of opinion that such preparations must prove of great service to those who are commencing the study of these groups; or to those who have no leisure for a special study, but still desire to acquire some knowledge of the structure of Fungi, Algæ, and other of the Cryptogamia. It is hardly to be expected that such a series

as that of Algæ should present in all its parts the same excellence or the same interest; and we doubt whether the larger Algæ are suitable for the purpose, whilst we miss many which would be sure to command attention. It may be an open question whether a good method of mounting Algæ has yet been devised. Somehow the cells will lose their plumpness, and their colour, even in certain cases becoming so transparent that the outline is lost. It has long been hoped that some method would be discovered of "mounting" Desmids so as to preserve the green colour unimpaired. If in his progress with the Algæ the Rev. J. E. Vize should be fortunate enough to issue a good typical series of fresh water algæ, we doubt not he will receive the encouragement he desires and deserves.

ONION SMUT (UROCYSTIS CEPULÆ).

Dr. Maxime Cornu has called attention to the appearance in France, and for the first time in Europe, of the American Onion Smut (*Urocystis cepulæ*, Farlow). The onions in the neighbourhood of Paris, principally the variety known as *l'Oignon de Nancy*, have been suffering from the attacks of this transatlantic pest, and, as Dr. Cornu points out, it is very probable that it will soon spread over Europe in the same manner as *Puccinia malvacearum* has done. When bringing the subject of this 'smut' under the notice of the Scientific Committee of the Royal Horticultural Society, some time since, we urged as an excuse that it was not at all improbable that it would make its appearance in Europe, and therefore it was well to be on the guard. The rapid and devastating spread of the Hollyhock disease, has proved how rapidly but surely these minute parasites travel. Let us hope that the *Peronospora* of the vine, which is akin to the potato disease, will not honour Europe with a visit, since the vine has already sufficient foes without any fresh importation. The onion smut is closely allied to one which attacks the meadow crocus (*Colchicum*), well known in Europe.

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A QUARTERLY RECORD OF CRYPTOGAMIC BOTANY
AND ITS LITERATURE.

NEW BRITISH HEPATICÆ.

By B. CARRINGTON, M.D.

The following species have been distributed in Carrington and Pearson's "Exsiccati":—

66. ***Riccia glaucescens*. Carr.**

Dioicous. Fronds flabellate-furcate, sometimes crowded and imbricating each other; segments linear-cuneate or battledore-shaped, concave, not canaliculate on the upper aspect, and surrounded by a rather broad border, recurved and convex when moist, but inflexed when dry.

Texture homogeneous, composed of large cells arranged in regular series, thickened along the mid-line of the lower surface, margins thinner, acute, fringed with small but strong translucent cilia which require a good lens for their recognition; sometimes these are wanting or irregularly disposed, and the border simply crenulate.

Apex of fronds emarginate, the lobes connivent, connected at the base by a lunate fold, between which there is often a small central tongue proceeding from the inferior lobe of the frond.

Colour, pale translucent glaucous green above, border somewhat paler, under surface covered laterally by a delicate membrane or detached scales of a purple colour, best seen when the plant is dry and the border incurved—mid-line brownish radiculose. Capsules few, occupying the hollow central channel near the base of the frond; spores large, dark brown, muriculate.

Riccia glaucescens, which was first shown to be ciliated by Mr. Pearson, from Barmouth specimens, is widely distributed throughout Britain. I have received it from various stations under the name *R. crystallina*, but that species, although resembling it in the large prominent surface cells, which reflect the light like those of the Ice Plant, is always destitute of cilia. *R. cavernosa* Hoff, which in like manner is often confounded with *R. crystallina*, may be recognised by the large air-cells beneath the surface layer, which become depressed and pitted when dry.

After a comparison with all the forms in my herbarium, the one it seems to approach most nearly is *R. Bischoffii*, Hübn., but in

that species the fronds are broader and shorter, generally bilobed, the lobes obovate to obcordate, channelled above, but thick and prominent beneath, surrounded with a broad membranous margin fringed with large obtuse cilia.

The fronds of *R. glaucescens* are about $\frac{3}{10}$ " to $\frac{7}{10}$ " in length by $\frac{1}{10}$ " to $\frac{1}{20}$ " in diameter, resembling the large form of *R. glauca* in size and colour, but in it the fronds are thinner, of the same colour on both surfaces, and the margin entire.

67. *Riccia tumida*. Ldg.

Fronds minute, crowded, thick and fleshy, oblong-pyriform, obtuse, remarkably narrowed at the base, margins tumid, covered with purple scales, and fringed with a double row of lanceolate cilia; capsules immersed, spores small, papillose.

From *R. ciliata* this is distinguished at once by the form of frond, purple scales, and double row of cilia.

In *R. ciliata* the segments are regularly furcate, more densely ciliated, linear-cuneiform, texture thinner, and both surfaces pale dirty green; whilst *R. glaucescens* may be known by the larger size, acute edges of the fronds, and less crowded ramification.

According to Lindberg, this is the *Riccia minima glauca, segmentis angustioribus, ad margines pilosissimis*, Nov. Gen. Pl. p. 107, n. 3, t. 57, f. 6.

First collected in Britain by Wm. Joshua, Esq., near Monmouth, May, 1877.—*B.C.*

76. *Gymnomitrium crassifolium*. Carr.

Tufts pulvinate, stoloniferous, nearly black when dry; shoots radiculose on the under surface, erecto-decumbent, irregularly innovant, ramuli ascending, sub-terete, the fertile ones clavate; exstipulate; leaves imbricated, erecto-secund, about twice the breadth of the stem, obliquely clasping, orbiculate, acutely emarginate, concave, segments short inflexed, sinus angular, of thick texture, scarcely altered when dry, minutely papillose, areolation dotted, sub-opaque, margin entire (not scarioso); outer involucreal leaves much larger, free, cleft for half their length into two obtusely-pointed lobes; inner involucreal leaves shorter, connate, laciniato-dentate; capsule spherical, pedicel short.

Hab. First collected at Craig Cognach (?) near Ben Lawers, in 1848, by A. O. Black.

The Ptarmigan, Perthshire, August, 1878, fertile, *C. J. Wild.*

Note.—*G. crassifolium* formed part of a collection of Hepaticæ, made about 1848, in the neighbourhood of Ben Lawers, by Dr. A. O. Black, and which came into the possession of Dr. M. C. Cooke. Mr. Wild, who was fortunate enough last summer to stumble on it—literally, since it was after a fall producing severe injury to the knee, and making frequent rests necessary, that this gentleman collected the species—described it as growing “in broad black patches on damp soil, with the habit of *Anthelia julacea*.” For a long time I mistook it for a form of *Nardia Funckii*, although noticing the more creeping habit, longer rootlets, and duller

closely imbricated secund leaves. Now that fructification has been found (only two capsules were met with), there can be no doubt as to its generic position. From *Gymnomitrium concinnatum* and *G. coralloides* it may be distinguished at a glance by the smaller size and absence of the creamy glaucous colour and the scariose margins of the leaves of those species. In our other species, *G. crenulatum*, which approaches it more nearly in size and colour, the shoots are more regularly terete, and have a wiry look and copery lustre, while the border of the leaf is scariose and crenulate-dentate.

85. *Jungermannia Nevicensis*. Carr.

Tufts cushion-like, pale green. Exstipulate; shoots $\frac{1}{2}$ to $\frac{3}{4}$ of an inch long, and not thicker than human hair, creeping and entangled at the base, flagelliferous, stem ascending, simple or irregularly branched, flexuous, apex curved, lower portion leafless, and, like the stolons, devoid of rootlets; leaves bifarious, alternate, scarcely broader than the stem, remarkably distant, vaginate, upper ones erect, roundish-ovate, lower erecto-patent ovate-subquadrate, complicate-concave, rounded at the base, apex boat-shaped, bidentate, lobes short acute, incurved, sinus acute (about one-fourth the length of the leaf), texture thin, the cells large, translucent—fructification?

Hab. Discovered on moist shelving rocks, near the last spring below the summit of Ben Nevis, July, 1875, by *Mr. J. Whitehead*, of Dukinfield.

Note.—Although conscious how objectionable it is to name species from barren specimens, the curious plant, which, through the liberality of the discoverer, I am glad to introduce to British botanists, differs so much from anything known to me, that I have ventured to call their attention to it, in the hope that fructification may be looked for, and its position determined.

The tufts resemble in size attenuate forms of *Jung. catenulata*, but the vertically patent conduplicate distant leaves, and the absence of rootlets on the creeping stolons, distinguish it from that and other allied forms.

In the creeping flagelliferous habit and position of the leaves it reminds us of *Nardia* (*N. Funckii*), but here again the distant leaves (nearly half a millimetre apart), the lax areolation devoid of trigones, and the weak succulent stems, the cortical layer composed of large quadrate cells, separate it from all known species.

The colour is lustreless yellowish-green, stolons, and sometimes the foliage, tinged with brown.

96. *Diplophyllum myriocarpum*. Carr.

Exstipulate, creeping at the base, rhizomatous shoots entangled, flexuose, polished, resembling pale-brown horse hair; stems terete ascending rigid, interrupted repeatedly, innovant, ramuli springing from one or both sides of the old axis, either barren and setaceous, or fertile, and with rapidly accrescent leaves. Leaves on the lower portion of the shoots and flagella distichous, approximate, erect and

appressed to the stem so closely as to be readily overlooked, ovate, carinate-concave, cleft for half their length into two lanceolate lobes, sinns acute, texture thin, chitinous, polished punctate-areolate, cells subquadrate, colour golden-brown. Involucral leaves much larger, vertically patent lobes shallower and more obtuse, half hiding the colesule. Colesule at first turbinate, when mature roundish-ovate, ventricose, obtusely-trigonus below, mouth contracted, 5·6 plicate, denticulate.

Hab. Creeping among the spongy peat-like soil in moist crevices of the rocks in the stream from Ben Venue running in the direction of the Trossachs Hotel. Growing in company with *Jung. laxifolia*, July, 1876.

If there is anything unsatisfactory about the individuality of *J. Nevicensis*, there can be none respecting the present species, which is one of the most interesting and distinct accessions recently made to our flora. In size it resembles *J. divaricata*, but its true alliance is with *Jung. minuta*, of which it might be accounted a microscopic form.

Owing to the rigid chitinous texture of *J. myriocarpa*, the stems, and even colesules, decay very slowly, so that it is not uncommon to find five or six colesules one above another, representing the growths of so many seasons. This gives the plant a very characteristic appearance when it is remembered that the shoots are rarely more than from five to seven millimetres in length.

The same proliferous habit is not uncommon in *Jung. minuta*. It is curious, too, that in both species the fructification is abortive and the *pistillidia* barren and undeveloped, probably from the absence of the male plant.

114. **Cephalozia multiflora.** (Huds.) Lindb.

In deference to the opinion of my friend, Mr. Slater, and I am given to understand of our greatest hepaticologist, Dr. Spruce, I insert this species under the above name. Whether it is the *J. multiflora* of Hudson I am unable to say, but the description in Withering and other old writers pertains to *J. setacea*.

The original figure of Dillenius, T. 69, f. 4, represents, it appears to me, a var. of *bicuspidata*, nor can I detect any reliable distinction between the one and the other. Any one who will examine a large series of *J. bicuspida* will be astonished at the variability in the form of the leaf and colesule, but the cell structure is remarkably uniform, and if once understood it would be impossible to confound it with true *J. connivens*.

In a note under *J. setacea*, **Brit. Jungerm**, T. viii., Sir W. Hooker remarks:—

“The specific name of *multiflora* was, in all probability, imposed upon this plant by Hudson, in consequence of the numerous foot-stalks represented in the Dillenian figure here quoted (T. 69, f. 4, *A.B.*), and has, in point of priority, a right to be retained; but, as not only that engraving (although cited by Hudson and Linneus), but also the original drawing in Sir Joseph Banks’

library, are extremely unlike our present plant, and especially as this species, in consequence of the paucity of its flowers, has been thought, by another eminent botanist, deserving of a name directly the reverse in its meaning, that of *J. pauciflora*. I have considered it best to do away with an appellation which can only tend to mislead, and to substitute in its room the very appropriate one of Weber. It is, indeed, merely in compliance with the opinion of preceding botanists, and contrary to my own, that I here refer to the Dillenian figure, which appears most like a very common appearance of *J. bicuspidata*, and was considered by Weber so doubtful that he quotes it under *J. setacea* with a mark of uncertainty. I was in hopes of ascertaining the fact by examining the specimen corresponding with the number in the Dillenian herbarium, but, to my great disappointment, what is there preserved is an injured morsel of *J. connivens*, Dicks, a plant to which neither the figure nor description bears the smallest resemblance!"—*B.C.*

ON THE IMPORTANCE THAT SHOULD BE ATTACHED TO THE DEHISCENCE OF ASCI IN THE CLASSIFICATION OF THE DISCOMYCETES.

By MONSIEUR E. BOUDIER.*

The discovery of the mode of dehiscence of the Asci in the Discomycetes is of recent date. Leveillé in the article *Peziza* in the Dictionnaire d'Histoire Naturelle de D'Orbigny, confessed he had never seen it, and it is to M. M. Cronan that we owe the first observations on the subject. These gentlemen saw clearly the operculum in the Ascoboli, and in some neighbouring species, but said they had never met with it in other *Pezizæ*. They also made it the special character of Ascobolus, and joined some species of the neighbouring genera amongst which they had observed it. More recently, in their "Florule du Finistère," in 1867, they imperfectly saw another mode of dehiscence in *Lecanidium atrum* (= *Patellaria atrata* Fr.), but they described it badly, for the sporidia, in all the *Pezizæ*, are discharged at the same time. The observations of these scientific men rested here, and they did not attach sufficient importance to their discovery.

Since this period, in 1869, in my "Mémoire sur les Ascobolés," I have pointed out the fact that this group was not the only one in which the asci may be provided with an operculum, and that this mode of dehiscence was to be met with in *Pezizæ* of the sections

* Read before the members of the Woolhope Field Club, at Hereford, Oct. 2, 1879. Translated by W. Phillips, F.L.S.

Humaria, *Sarcoscypha*, *Aleuria*, and likewise in *Verpa*, *Helvella*, and *Morchella*, while *Helotium* and the neighbouring genera *Leotia*, *Mitrula*, and *Geoglossum* presented a different mode of dehiscence.

At this time, after the examination of a considerable number of Discomycetes, I am able to call the attention of mycologists to the necessity of separating this family into two very natural sections, according as to whether the mode of dehiscence is with, or without an operculum. I would call the first section by the name of *Operculate Discomycetes*, or simply *Operculæ*, because in this section the opening of the asci takes place by the elevation of a little lid at its summit. The second I would call *Inoperculate Discomycetes*, or simply *Inoperculæ*, because the exit of the sporidia takes place by a small hole, formed at the extreme summit of the asci, with its margin more or less elevated, but without any appearance of an operculum.

There is no great difficulty in observing this dehiscence, although few authors mention it. A very little attention soon renders it quite familiar, and I consider its careful observation indispensable to a good classification of genera and species.

In the first division, the *Operculæ*, the dehiscence is accomplished by the formation of a circular slit at the summit of the ascus. The tension produced when at maturity by the increase of their growth causes them to rupture circularly at the summit, following the slit which is formed there, as I have previously pointed out in certain *Ascoboli* ("Mém. sur les *Ascobolés*," p. 11, pl. 10, fig. xxxi and 8 and 9), throwing the operculum back by the sudden projection of the contents of the ascus leaving it generally a little elevated, with one space open or sometimes almost closed. This operculum varies according to the form of the extremity of the ascus. It is convex, when it is round, as in certain *Humaria* and *Ryparobius*; it is flattened, when the ascus is truncate, as in *Aleuria*; it is mammular in the centre, when the extremity presents a similar character to *Ascobolus*.

When the ascus is larger, it often bends on each side, which causes it to appear oval or triangular, as often occurs in *Saccobolus*. In almost all cases it retains its round form very clearly when seen in front, and slightly raised when seen in profile. The circular slip is almost always horizontal, but in a few rare instances it is oblique, as in some species of *Humaria*. In one particular genus, so well named by Mr. Renny, *Ascozonus*, it is perpendicular, and this form caused me to doubt for a long time as to the true place this genus ought to occupy. If it be considered as a slit, it will come in the *Operculæ*, and I am now of this opinion, in consequence of the great affinity existing between this genus and *Ryparobius*. If it be considered as a simple rent of the apex of the ascus, which would not be capable of softening, it will enter into the second section, as I had at first thought. But I repeat such cases form very rare exceptions to the general rule.

The group of Discomycetes, dehiscing by an operculum, presents some characters which give an appearance of close relationship to all the species belonging to it. Thus the sporidia of all those with which I am acquainted are simple; that is to say, they are without septa, spherical, or more frequently, oval, or elliptical in shape, with their extremities rounded, rarely acuminate. They are often warty and sometimes are reticulated. The consistence of the cups is almost always waxy, less elastic than in the second division, except in some rare exceptions. The hairs which are sometimes found on the exterior are generally of a different structure. The greater number of the species are found on the earth, on dung, the soil of old trees, or rarely they are met with on sound dead wood or on the bark. This first division includes the *Morels*, the *Helvellas*, the *Verpas*, the *Pezizæ* of the sections, *Aleuria*, *Humaria*, many of the *Lachnæ*, *Ascobolus* and the greater part of the genera which are derived from this section.

The second division, the *Inoperculæ*, is clearly separated from the first. There is no longer a transverse or oblique slit at the extremity of the ascus; the extremity itself becomes softened in the centre at the moment of maturity, and the tension which is then produced ruptures it, permitting the escape of the sporidia with the liquid in which they exist. By the fact of this emission, the margin of the opening becomes more or less turned like a collar, either entire or slightly toothed, remaining often very visible, as in *P. tuberosa*, *P. rapulum*, and *P. echinophila*; but sometimes also closing together, so that in order to distinguish the opening, it is necessary to prove its existence by squeezing the thin walls of the ascus together, as in the small *Mollisia*, *Mitrula*, &c. Most frequently, the extremity of the ascus presents a broad truncated nipper, very thin in the centre.

The species of this section frequently have sporidia with a tendency to division, or they are clearly divided; and very often they are simple, but become divided at the time of germination. I know of none that are verrucose or areolate; they are rarely spherical, but most frequently fusiform, more or less elongated, and sometimes club-shaped; many are more or less curved, and in general they are much smaller than those of the species in the first section. The consistence of the cup is more firm and elastic, and much less waxy; the hairs when they exist have a different appearance. The species are rarely terrestrial, being much oftener found on dead wood, dead leaves and stems, and sometimes even on the living branches. This second division includes *Geoglossum*, *Mitrula*, *Leotia*, *Phialea*, *Helotium*, *Lachnella*, *Mollisia*, and all the genera belonging to them.

There exists a little group of ascigerous fungi in which the mode of dehiscence is not yet well known: I allude to the true *Tuberaceæ*, *Tuber*, *Elaphomyces*, and others, that is in fungi completely closed, in which the asci are altogether internal and cannot discharge their sporidia externally. I think that in

this group the asci do not open, but disappear insensibly by absorption, and thus leave their sporidia free. This group, altogether natural and distinct, certainly belongs to the Ascomycetes, but should not be placed in the Discomycetes, from which they differ notably. I may say the same of the Pyrenomycetes in which the greater part of the species probably have dehiscent asci, but this family, in which the processes are most difficult to observe, does not come within the limits to which I confine myself.

It will be seen from what I have said, how much importance I attach to the mode of dehiscence, and it is with the view of inducing mycologists to observe it more carefully that I have dwelt upon it. There is no great difficulty in observing it, a magnifying power of 300 diameters is sufficient, but it is necessary to search for it at the upper extremity of the open asci. These asci are always to be recognised by the absence of protoplasm, by which they differ from the young plants which have not yet formed their sporidia. Moreover, the tincture of iodine may be employed, which colours the membrane and renders the operculum more visible. This tincture should, indeed, always be employed in the examination of species, because it often gives a deep blue colour at the extremity of the ascus, as in *Aleuria* proper, *P. cochleata*, *P. badia*, *P. vesiculosa*, and others, and the character has a certain value; in other cases the colour is fainter, as in *P. firma*, *P. echinophila*, &c.; in other cases again, only the extreme margin of the opening is tinted, as in *Mitrula*, or it appears as a blue point, while more frequently the iodine does not produce any other colouration than a yellowish tint to be produced.

I believe these observations are of great use in the natural classification of the numerous species of this difficult family, upon which the efforts of the most able mycologists have been more and more engaged of late. I believe, too, it may prevent other less happy arrangements. I will mention for example *Peziza tuberosa* and *P. rapulum*, which have their asci inoperculate, placed by Persoon and by Fries, and even by modern authors, amongst the *Aleuria*, in which these organs are operculate. Nevertheless these species have something in their aspect nearly approaching *Phialea*, as Persoon in his Synopsis (p. 644) had already remarked "*de intuitu*" of *P. tuberosa*.

The *Lachnea*, *Humaria*, and other genera beside with operculate asci, contain many species which ought to be withdrawn and placed in the second division.

It is only by examining the species in a fresh state that any perfection can be attained in a study so difficult as the classification of *Pezizæ*. In the dry state these observations are very difficult and often impossible, in consequence of the contracted condition in which the asci are found.

These two sections in the *Discomycetes* form two parallel series agreeing well in the base. Thus the *Operculæ* commence with the

species of a more elevated order, as *Morchella*, *Verpa*, *Helvella*, passing by the *Peziza* in the sections *Aleuria*, *Lachnea*; descending by *Humaria*, *Ascobolus* to *Ryparobius* and *Ascozonus*; ascending again in the *Inoperculæ* by the small genera of *Mollisia*, *Lachnella*, *Phialea*, as far as *Leotia*, *Mitrula*, and *Geoglossum*; that is to say almost to the height of the highest species of the first section, only changing very slightly, as I have shewn, the classification now generally adopted.

FUNGI EGYPTIACI.

Collecti per Dr. GEORG SCHWEINFURTH.—*Determinati per*
F. DE THUEMEN.

SER. II.

(*Ser. I. vide "Grevillea VI., p. 102-104.*)

19. **Phythophthora infestans.** *DeBy.* *Peronospora infestans.* DeBy.
Ad folia viva *Solani esculenti* Dun. Medinet in Fajum, 1,
77 (Specimina valde corrupta!)

20. **Gloeosporium Schweinfurthianum.** *Thuem.* Nov. spec.

G. acervulis epiphyllis, subgregariis, sine macula, mediis, plano-verrucaeformibus sublenticularibusve, dilute olivaceis, vix emersis; sporis longe ellipsoideis, simplicibus, utrinque subobtusatis, homogenis, achrois, 16-18 mm. long, 7-8 mm. crass.

In *Erodii glaucophylli* L'Herit. foliis vivis et languidis in deserto ad Wadi-Dugla pr. Cairo, 5, 79.

21. **Oidium erysiphoides.** *Fr.*

In *Trigonellæ stellatæ* Forsk. foliis vivis in deserto pr. Wadi-Ashar, 3, 77.

22. **Oidium erysiphoides.** *Fr.*

In *Fænugræci officinalis* Moench. foliis vivis pr. Adulh in Fajum, 3, 79.

23. **Oidium erysiphoides.** *Fr.*

Ad folia viva *Lini usitatissimi* Linn. Pr. Senura in Fajum, 3, 79.

24. **Oidium erysiphoides.** *Fr.*

In foliis vivis *Viciæ calcaratæ* DeC. Pr. Senura in Fajum, 4, 79.

25. **Oidium medicagineum.** *Thuem.* Nov. spec.

O. cæspitibus late effusis, epi-raro etiam hypophyllis, pulveraceis, dilute ochro-albidis; hyphis brevibus e mycelio repente erectis, simplicibus, continuis, hyalinis; sporis numerosis, magnis, elliptico-parallelogrammis, utrinque obtusatis et minime angustatis medio subdilatisve, episporio lævi, subcrasso, hyalinis, 26-28 mm. long, 9-10 mm. crass.

In *Medicaginis denticulatæ* Willd. foliis vivis pr. Serssene in Fajum, 3, 79.

26. **Ustilago Penniseti.** *Koernik.* in "Hedwigia," 1877, p. 35.
Thuemen, "Mycotheca Universalis," No. 1318.

In ovariis *Penniseti dichotomi* Delile. Ad Wadi-Hof pr. Heluan pr. Cairo, 3, 77.

Obs. Sporæ magnitudinis diversissimæ, 5.5-10 mm. diam., valde irregulariter globosæ, sæpe subangulosæ, conglobatæ, non punctulatae, episporio crassissimo, 1.8-2 mm. crasso.

27. **Ustilago carbo.** *Tul.*

f. *Tritici vulgaris.*

In ovariis vivis *Tritici vulgaris* Vill. In oasis Chargeh, 3, 74.
 Ab incolis interdum libatum.

28. **Ustilago carbo.** *Tul.*

f. *Cynodontis dactylonis.*

In *Cynodontis dactylonis* Lin. spicis pr. Chargeh, 2, 74.

29. **Ustilago Tulasnei.** *Kühn.* in "Rabh. Fungi Europæi," No. 1997.

In *Sorghi vulgaris* Pers. ovariis ad Rigga pr. Cairo, 12, 64.

30. **Ustilago Fschæmi.** *Fuck.*

Ad *Andropogonis* speciei indeterminatæ spicas vivas pr. Theubaghattas in Djur, 9, 69.

31. **Sorosporium desertorum.** *Thuem.* Nov. spec.

S. ovaria replectens subturgensve, cum massam grumosam, atherimam complectens, paleas infuscaus; sporis irregulariter globosis vel rotundo-ovatis vel subcompresso globosis, episporio tenui, vix papilloso, punctulato, fuscis, 8-10.5 mm. diam.; in glomerulis subglobosis vel irregularibus, 35-50 mm. diam., congregatis.

In ovariis vivis *Coelorrhachidis hirsutae*, Brongt. (*Rottboellia hirsuta* Vahl.), in Wadi-Gundeli pr. parietinas, "Dar-el-Beda," in deserto medio, 4, 79.

32. **Puccinia verruca.** *Thuem.* in "Revue Mycologique," I., p. 9.

Ad folia viva *Centaureæ napifoliae* Lin. Com. Dr. Karl Keck.

33. **Uromyces Lupini.** *Sacc.* in "Nuovo Giornale Botanico Italiano," 1873, p. 274.

Ad *Lupini digitati*. Forsk. folia viva pr. Senura in Fajum, 4, 79.

Obs. A *Uromyceti Lupini* Berk. et Curt. in Proceed. Amer. Acad. of Arts, IV., p. 127, valde diversus.

34. **Uromyces Trigonellæ.** *Pass.*

In foliis vivis *Foenugræci officinalis*. Moench. pr. Aksieh in Fajum, 4, 79.

35. **Uredo Frankeniae.** *Mntg.* in Barker Webb. "Hist. Canar.," V., p. 90.

Ad *Frankeniæ pulverulentæ* Lin. folia viva pr. Serssena in Fajum, 3, 79.

36. **Uredo Isiacæ.** *Thuem.* Nov. spec.

U. in foliis vaginisque acervulos maximos, latissime effusos, usque ad 6 centim. longos, et 1.5 centim. latos formans; acervulis ferrugineis, pulveraceis, primo tectis, demum liberis, inquinantibus; sporis ellipsoideis, utrinque æqui-rotundatis, episporio lævi, crassissimo, dilute fasciculatis, 22-26 mm. long, 16-20 mm. crasso, episporio 5-6 mm. crasso.

In foliis vaginisque vivis *Arundinis Isiacæ* Delile. Ad Heluan pr. Cairo in piscina aquæ sulfureæ, 6, 77.

37. **Melampsora Euphorbiæ.** *Cast.*f. *Euphorbiæ Peplidis.*Ad *Euphorbiæ Peplidis* Lin. folia et caules vivos pr. Adueh in Fajum, 3, 79.38. **Melampsora Euphorbiæ.** *Cast.*f. *Euphorbiæ prunifoliæ.**Fungus stylosporiferus* = *Uredo Euphorbiæ* Pers.In foliis vivis *Euphorbiæ prunifoliæ.* Facq. Ad Ballas pr. Kaliub., 2, 79.39. **Melampsora Lini.** *Tul.*f. *Lini usitatissimi.**Fungus teleutosporiferus.*Ad caules languidos *Lini usitatissimi* Lin. Ad Medinet in Fajum, 1, 77.40. **Sphæropsis Calotropidis.** *Thuem.* Nov. spec.

Sph. maculas magnas, epiphyllas, asteromoides, plus minusve orbiculatas, late effusas et sæpe confluentes, griseo-olivaceas, fere subpulveraceas formans; peritheciis densissimæ gregariis, numerosis, minutis, punctiformi-conicis, atris; sporis cylindrico-ellipsoideis, vertice acutatis, basi angustato-obtusatis, simplicibus, 20-30 mm. long, 6 mm. crass., pallidissime cinerascens in sterigmatibus sublongis, tenuibus, rectis vel subarcuatis, 10-18 mm. long.

Ad folia languida *Calotropidis procere* R. Br. pr. Berber in Nubia, 1866.41. **Cicinnobolus Cesatii.** *DeBy.*In *Viola calcaratæ* Desf. (In *Oidio erysiphoides* Fr. parasitans) foliis vivis pr. Senures in Fajum, 4, 79.42. **Cicinnobolus Cesatii.** *DeBy.*Ad folia viva *Lini usitatissimi.* Lin. (In *Oidio erysiphoides* Fr. parasitans), pr. Senures in Fajum, 3, 79.

A NEW GENUS OF DISCOMYCETES.*

By M. C. COOKE.

The Discomycetes are a large group of fungi, which form a portion of the order of Ascomycetes. The substance of which the fungus is composed is of a fleshy or waxy nature, very similar to the soft flesh of many of the Agarics, and never hard, corky, or brittle, as in most of the Sphæriacei. It is true that some genera of the Sphæriaceous group, such as *Cordyceps* and *Hypocrea*, have a similar fleshy substance, or stroma, but in these we recognise another point of difference, in the asci being enclosed within definite perithecia, which are embedded in the stroma, whereas in the Discomycetes there are no perithecia, the hymenium being always continuous over the fructifying surface. The form of the

* A paper read at the annual meeting of the Woolhope Club, at Hereford, October 2.

Discomycetes is doubtless variable, but this follows two types, the one pileate, the other cupulate, the one club-shaped, the other cup-shaped, with their various modifications. In the latter the hymenium lines the concavity of the cup, in the former it is spread over the outer upper surface, being deficient in the stem. There is no exception to this general rule, so that it is never difficult to indicate the position and limits of the hymenium. They are, therefore, fleshy ascomycetous fungi, with the hymenium, or fructifying surface confined to a definite area, but never enclosed in perithecia.

As in all other branches of natural history we encounter aberrant forms, which possess great interest because they depart from the general type, so here, amongst the Discomycetes, I have to describe an aberrant form, which possesses a general interest to the mycologist as a new arrangement or inversion of parts or organs.

In 1874 and 1875, Dr. Berggren, of Lund, visited and collected in New Zealand, and amongst others he obtained a large and interesting collection of fungi, and made about one hundred rough water-colour sketches. These fungi have passed into my hands for determination, and among them the subject of this communication, together with two "sketches from the life."

The fungus, which I purpose calling BERGGRENIA, is ovate, pyriform, somewhat clavate, about one inch in height, and nearly as much in width, but compressed laterally to one-fourth of that thickness in one direction. It is described as looking very much like a *Tremella*, being a little plicate or ribbed below and inflated, so that the centre is hollow, and though attenuated a little at the base there is no distinct stem. The base is watery white, the upper half a bright reddish orange.

For some time I was puzzled with this, which at first I regarded as a *Tremella*, or *Guepinia*, or it might be an ally of *Spathularia*; softened and examined under the microscope I could find no external trace of hymenium, nothing but a tough cellular tissue of large and uniform cells, until at length, almost in despair, I cut open one of the specimens, and found the inner walls softer, rugose, and so different in texture that at once, more out of curiosity as to the character of the cells, than hope to find the hymenium, I examined a portion of the inner wall, and found it to consist entirely of an effused hymenium of large, closely-packed, cylindrical asci, each containing its eight elliptical sporidia, but without paraphyses. In fact here is an inflated fleshy sac, with the hymenium enclosed and covering the whole of the inner surface. It is a *Spathularia* turned inside out, and is of far more importance to us than a mere new species or a new genus could be, presenting to those who are acquainted with the structure of the Discomycetes a most interesting subject for study and reflection, adding yet another to the contrarieties of the antipodes.

It may not be out of place to allude to the affinities which this

new fungus seems to present. There is no doubt whatever that the hymenium is entirely enclosed, although both figures and specimens exhibit ruptured individuals in which the hymenium is laid bare; but if we consider that in a perfectly closed specimen the hymenium was fully matured, there is no reason to conclude that a wholly enclosed hymenium is not its normal condition. Perhaps *Sphærosoma* comes nearest to *Berggrenia*, except that it has a thicker and firmer periderm, and is moreover hypogæous. This affinity is sufficient to prove that it is not impossible for a plant of such a structure to be a Discomycete, and Tulasne considered *Sphærosoma* to be a Discomycete although evidently so very closely related to *Genea*. Indeed, in my opinion *Sphærosoma* is further removed from the Discomycetes in the direction of the Tuberacei than *Berggrenia* from some species of *Peziza*.

There is a great similarity in the character of the fruit, and in the fleshy stroma, as to texture, &c., between *Cyttaria* and *Berggrenia*; in fact, the latter resembles the former, inverted, and the areolæ suppressed. The hymenium is confined in some *Cyttariæ* to a few nearly closed cells, and although the relationship is by no means close in any direction, I am inclined to place *Berggrenia* in the *Bulgariacei*, nearest perhaps to *Cyttaria*. The discovery hereafter of intermediate links may render the affinities clearer than at present they seem to be; under any circumstances the new genus has a higher interest than its mere position in any system of classification.—From the "*Gardeners' Chronicle*," Oct. 25, 1879, p. 533.

AGARIC WITH GREEN SPORES.

We have lately received from Mr. Morgan, of Ohio, U.S., a dried specimen of an Agaric, with all the external features of a large *Lepiota*, with a pileus nine inches in diameter, which has spores when first thrown down of a bright green colour, but upon drying these become of a duller verdegris green. This fungus has been named *Agaricus Morgani*, Peck, and is interesting as being unique in the colour of the spores. It is not an accidental circumstance which has affected a single specimen, but one which is characteristic of the species. The individual spores, in the dried state, exhibit no colour when the light is thrown through them on the stage of the microscope. Probably this may not be the case with fresh spores. At any rate, the circumstance is worthy of being recorded.

NEW ZEALAND FUNGI.

By M. C. COOKE.

The following is an enumeration of a portion of the Fungi collected in New Zealand by Dr. S. Berggren, of Lund, during 1874 and 1875, with a few species collected at the same time on the "Dividing range" in the north of Melbourne, Australia. The collection also includes some Fungi from the province of Wellington, obtained by W. T. L. Travers, Esq., F.L.S., which were placed at Dr. Berggren's disposal. The residue of the collection, chiefly Hymenomycetes, will be enumerated hereafter.

Agaricus (Armillaria) melleus. *Vahl. Fr.; Epic., p. 23.*

On trunks. Maungaroa (144).

Agaricus (Naucoria) semiorbicularis. *Bull. Champ., t. 422.*

On dung. Waitaki (61).

Hygrophorus miniatus. *Fr. Epic., 330.*

On the ground. Maungaroa (154).

Hygrophorus cyaneus. *Berk. in Hdbk., N.Z. Flora, p. 604.*

On the ground. Waitaki (85), with figure.

The colour as shown in the drawing is verdigris-green, but in other respects it does not appear to differ from the typical form in any essential particular.

Cantharellus umbriceps. *Cooke sp. nov.*

Pileo carnosio, molli, e convexo depresso, glabro, umbrino; margine incurvo; stipite solido, pallido, sursum attenuato; lamellis subconfertis, dichotomis, aurantiacis.

On the ground. Maungaroa (138).

Pileus about an inch broad; stem two inches long, half an inch thick at the base, attenuated upwards; flesh tinged with orange; spores small, subglobose.

Schizophyllum commune. *Fr. Epic., 403.*

On trunks. Otawa, Bay of Islands, Ohaeawai, Maungaroa, Banks' Peninsula, Little River, Wellington (Travers), Melbourne (Australia).

Polyporus (Mesopus) arcularius. *Fr. Hym. Eur., p. 526.*

On the ground. Waima, Bay of Islands, Ohaeawai.

Polyporus (Mesopus) oblectans. *Berk. in Hook. Journ., 1845, p. 51.*

On the ground. Melbourne (Australia, 364), Lake Taupo (317).

Polyporus (Pleuropus) rhipidius. *Berk. in Hook. Journ., 1847, 319.*
var. **curtipes.**

On bark, &c. Melbourne (Australia, 380, 374), River Bealey (348), Bay of Islands (236).

Polyporus (Pleuropus) melanopus. *Fr. Hym. Eur., 534.*
Melbourne (Australia).

Polyporus (Anodermei) hemitrephius. *B. Fl. N. Zeal.*
Resupinate form.

On trunks. Coromandel (392).

Polyporus (Anodermei) cinnabarinus. *Fr. Hym. Eur.*, 583.

On trunks. Coromandel, Waitaki, Maungaroa, Bay of Islands, Banks' Peninsula, Westland, Wellington (Mr. Travers), Melbourne (Australia, 382).

Polyporus (Anodermei) dichrous. *Fr. Hym. Eur.*, 550.

On trunks. Wellington (Travers), Coromandel, Ohaeawai, Waitaki (256), Winton (226, 350), Dunedin.

Polyporus (Placodermei) applanatus. *Fr. Hym. Eur.*, 557.

On trees. Hokianga, Melbourne (Australia).

Polyporus (Placodermei) australis. *Fr. Hym. Eur.*, 556.

On trunks. Maungaroa.

Polyporus (Placodermei) pectinatus. *Klot.; Fr. Hym. Eur.*, 559.

On trunks. Bay of Islands (334).

Polyporus (Placodermei) Zealandicus. *Cke.*

Pileo suberoso-coriaceo, duro, convexo, supra concentricè sulcato, subrugoso, atro-umbrino, margine obtuso, velutino, pallidiore; carne zonato, ferrugineo; poris prælongis, stratosi, minimis, rotundatis, fusco-ferrugineis, demum caryophyllaceis.

On trunks. Coromandel (309, 310).

No. 309 is evidently a resupinate form of No. 310. Three to six inches broad, when resupinate extending for nearly a foot. The hymenium is surrounded by a broad sterile, velvety margin, which is scarcely so distinct in the resupinate form. Allied to *P. applanatus*, Fr., but quite distinct.

Polyporus (Placodermei) leucocreas. *Cke.*

Pileo e carnosio suberoso, unguato, glabro, albido, demum pallido, cute rivuloso-fatiscente, intus niveo, spongioso, tenaci; hymenio convexo, rimoso; poris angulatis, minimis, brevibus, albis. (vix *P. betulinus*.)

On charred wood.

Substance snowy-white, not at all fragile as in *P. officinalis*, but firm and tough; pileus 6 inches across, 4 inches high.

Polyporus (Inodermei) radiatus. *Fr. Hym. Eur.*, 565.

On trunks. Melbourne (Australia).

Polyporus (Inodermei) hirsutus. *Fr. Hym. Eur.*, 567.

On bark. Ottawa (336).

Polyporus (Inodermei) tabacinus. *Mont. Syll.*, 167.

On bark. Wellington (Travers, 368), Maungaroa (319).

Polyporus (Inodermei) versicolor. *Fr. Hym. Eur.*, 568.

On trunks. River Otira, Canterbury Alps (313), Winton (350), Waitaki (345), Banks' Peninsula (330).

Polyporus (Resupinati) catervatus. *Berk. Fl. N. Zeal.*

On bark. Wellington (Travers).

Polyporus (Resupinati) vaporarius. *Fr. Hym. Eur.*, 579.

On bark and wood. Maungaroa (219, 222), Melbourne (Australia, 373).

Polyporus (Resupinati) vulgaris. *Fr. Hym. Eur.*, 578.

On branches. Winton (232).

Hydnum Sinclairii. Berk. in Hook. N. Z. Flora, p. 756.

On the ground. Maungaroa (320)

Tremellodon gelatinosum. Fr. Hym. Eur., 618.

On trunks. Maungaroa (152).

Kneiffia setigera. Fr. Hym. Eur., 628.

On naked wood. Waitaki (278).

Thlephora pedicellata. Schuz Syn. Car., t. 2, f. 3.

On bark. Maungaroa (221).

Hymenochæte rubiginosa. Lev. Fr. Hym. Eur., 641.
(sub *Stereum*.)

On bark. Wellington (Travers. 370).

Hymenochæte rhabarbarina. Berk. Flor. N. Zeal. (sub *Corticium*.)

On bark and wood. Ottawa (335).

Hymenochæte phæa. Berk. in Fl. N. Zeal. (sub *Stereum*)

On bark. Waima (338).

Stereum vellereum. Berk. in Fl. N. Zeal.

On branches. Wellington (Travers, 373), Waitaki (279, 270, 257), Winton (351), Maungaroa, Melbourne, (Australia 365).

Stereum decipiens. Berk. in Herb.

On charred wood. Melbourne (Australia).

Stereum lobatum. Kze. Fr. Epic., 547.

On trunks. Hokianga (337), Wellington (Travers, 369), Ohaeawai (340).

Stereum acerinum. Fr. Sys. Myc. i., 453.

On twigs. Wellington (Travers, 376).

Stereum pannosum. Cke.

Pileo coriaceo, rigido, effuso-reflexo, cinereo, subzonato, hirsuto; hymenio nudo, glabro, radiato-rimoso laceratove, cinereo, demum pruinoso.

On bark of trees. Dunedin (315), Waitaki (342).

Effused for three or four inches, with the margin torn and split, separable, slightly reflexed above and villous. Entirely cinereous.

Stereum versiforme. B. & Curt. N. Amer. Fungi, No. 242.

On wood. Melbourne (Australia).

Corticium læve. Fr. Hym. Eur., 649.

On branches. Wellington (Travers, 374).

Corticium serum. Fr. Hym. Eur., 659.

On bark, &c. Waitaki (260).

Peniophora crustosa. Cke. sp. nov.

Effusa, crassa, dura, perennis; hymenio irregulari-lobato, pallido, lævi, velutino; margine subelevato; setulis obclavatis, hyalinis, asperulis (0.4×0.15 mm.).

On bark. Waitaki (347).

Resembling in appearance *Stereum annosum*, B. & Br., but with the characteristic bodies on the hymenium, which are peculiar to *Peniophora*. Spores elliptic or reniform, 0.007×0.003 mm.

Cyphella muscigena. Fr. Hym. Eur., 663.

On mosses. Melbourne (Australia).

Cyphella Curreyi. *B. & Br. Fr. Hym. Eur.*, 663.

On branches. Melbourne (Australia, 376).

Cyphella Zealandica. *C. & Phil.*

Sparsa, sessilis, pallida, villosa, 1-3 mm. diam. Cupulis excavatis, margine incurvo. Spores ellipticis, infra apiculatis (0.024×0.015 mm.).

On bark and twigs. Winton (230).

The dense flexuous hairs are about three to four-tenths of a millimetre long. A most distinct and notable species. I am indebted to my friend, Mr. W. Phillips, of Shrewsbury, for assistance in the examination of this and many of the Discomycetes.

Clavaria amethystina. *Bull. t.* 496, f. 2.

On the ground. Waitaki (3).

Clavaria inæqualis. *Fr. Hym. Eur.*, 674.

On the ground. Waitaki (74).

Clavaria juncea. *Fr. Hym. Eur.*, 677.

On dead leaves. Melbourne (Australia).

Calocera glossoides. *Fr. Hym. Eur.*, 681.

On wood. Waitaki ($\frac{5.6}{5.6}$ bis., 343), Wellington (Travers, 363), Melbourne (Australia), Maungaroa.

var. spathulata.

On dead wood. Waitaki (11).

Calocera cornea. *Fr. Hym. Eur.*, 681.

On dead wood. Waitaki (38 bis.).

Pistillaria micans. *Fr. Hym. Eur.*, 686.

On herb stems. Waitaki (78).

Tremella albida. *Fr. Hym. Eur.*, 691.

On branches. Winton (107).

Tremella mesenterica. *Fr. Hym. Eur.*, 691.

On branches. Winton (109).

Tremella foliacea. *Pers. Obs. i.*, 93.

On branches. Wellington (Mr. Travers).

Tremella lutescens. *Fr. Hym. Eur.*, 690.

On branches. Maungaroa, Winton (108).

Exidia tenax. *Cke. sp. nov.*

Effusa, applanata, undulato-lobata, fuliginea; papillis minimis conspersa, subtus lævi. Basidiis clavatis, furcatis (?)

On branches. Winton (111).

Very tough, much flattened, and more delicate than *E. glandulosa*, to which it is allied. The specimens are probably immature, no globose basidia were seen.

Hirneola polytricha. *Fr. Fung. Nat.*, p. 26.

On dead trees. Waima, Maungaroa, Waitaki, Coromandel, Westland, Ohaeawai, Hokianga, Wellington (Mr. Travers).

Guepinia pezizæformis. *Berk. Hook Lond. Journ. vi.*, p. 60.

On wood. Melbourne (Australia), Maungaroa, Wellington (365).

Guepinia spathularia. *Fr. Epic.*, p. 566.

On wood. Maungaroa, Winton (110).

Guepinia fissa. Berk. Ann. N. H. x., 383.

On sticks. Winton.

Dacrymyces deliquescens. Fr. Hym. Eur., 699.

On naked wood. Waitaki (83, 271), Winton (77), Wellington (Mr. Travers).

Coryne rugipes. Cke. sp. nov.

Minima. Stipite rugoso-sulcato, pallido; capite ochraceo, depresso-globoso, lævi, glabro; sporis minutis, linearibus.

On wood. Waitaki (82).

Not more than a quarter of an inch high. It is a *Coryne*, as interpreted by Berkeley, and not by Tulasne.

Cyathus similis. Cke. sp. nov.

Campaniformis, sessilis, superne late apertis, striis plane destitutus, extus pallide ochraceus, sericeo-tomentosus, intus fusco-cinereus. Sporangii ellipticis, nigris, lævibus; tunica crassa. Sporibus ovatis, hyalinis.

On the ground. Banks' Peninsula (216).

Sporangia $3\frac{1}{2} \times 2\frac{1}{2}$; epiderm $\frac{1}{10}$ mm. thick; spores $.012 \times .009$ mm.

Greatly resembling *C. vernicosus*, DC., but distinct in the sporangia and spores. Probably it was this which Berkeley referred doubtfully to *C. Emodense*, B.

Cyathus vernicosus. DC. Cke. Hdbk., No. 1199.

On the ground. Wellington (Travers).

Crucibulum vulgare. Tul. Ann. Sc. Nat. 1844, 90.

On dead wood. Waitaki, River Bealey, Little River, Otira, Winton, Wellington (Travers).

var. lanosum. Cke.

Paler than in the usual form, externally woolly. Sporangia $1\frac{1}{2}$ mm., brownish; sporidia shorter by nearly one-third. A very neat variety, perhaps a distinct species.

On sticks. Wellington (Mr. Travers).

Sphæroboles stellatus. Tode. Cke. Hdbk., No. 1202.

On dung. Winton (120).

Ileodictyon cibarium. Tul. Berk. in El. N. Zeal. ii., 188.

On the ground. Waitaki, Winton.

Aseröe rubra. Labill. Fl. N. Holl.

On the ground. Hokieika, Winton.

Mitremyces fuscus. Berk. in Flora Tasm.

On the ground. Melbourne (Australia).

Scleroderma vulgare. Fr. Sys. Myc. iii., 46.

On the ground. Wellington (Mr. Travers), Banks' Peninsula (327).

Lycoperdon reticulatum. Berk. Fl. N. Zeal. ii., 190.

On the ground. Melbourne (Australia).

Bovista lilacina. Mont. & Berk. in Hook. Lond. Journ., 1845, 64.

On the ground. Waitaki.

Lycoperdon gemmatum. Fr. Sys. Myc. iii., 36.

On the ground. Maungaroa (223), Waitaki (57-58).

Lycoperdon pyriforme. *Schff., t. 189.*

On the ground and stumps. Waitaki (300), Ohaeawai (341), Melbourne (Australia).

Geaster fimbriatus. *Fr. Sys. Myc. iii., 16.*

On the ground. Maungaroa.

Polysaccum pisocarpium. *Fr. Sys. Myc. iii., 54.*

On the ground, Lake Taupo; with empty peridia from other localities.

Secotium erythrocephalum. *Tul. Berk. in Fl. N. Zeal. ii. 187.*

In grassy places. Banks' Peninsula, Waitaki, Dunedin, Maungaroa, Wellington (Mr. Travers).

Paurocotylis echinosperma. *Cke. sp. nov.*

Depresso-globosa (vix 1 c.m.), extus carneo-fulva, intus marmorata. Sporis globosis, echinulatis (0.12-0.14 mm. diam.).

On wood. Melbourne (Australia, 360).

A very distinct species of this very curious genus, which seems much more closely related to *Gasteromycetes* than to *Physomycetes*.

Paurocotylis fulva. *Berk. & Br. Ceyl. Fungi, No. 1181.*
var. **Zelandica.**

On woods. (Winton (401).

The spores are larger, and more distinctly coloured than in the original typical specimen of *P. fulva*, but we hesitate to separate it on the faith of a single specimen.

Craterium vulgare. *Ditm. in Cke. Myx., p. 18.*

On herbs. Maungaroa (220).

Lycogala epidendron. *Buxb. Cke. Myx., p. 75.*

On wood. Wellington (Mr. Travers).

Stemonitis ferruginea. *Ehr. Cke. Myx., p. 47.*

On rotten wood. Wellington (Mr. Travers).

Trichia fragilis. *Sov. Cke. Myx., p. 62.*

On dead wood. Winton (229).

Trichia varia. *Pers.; Cke. Myx., p. 63.*

On twigs, &c. Waitaki (81).

Rhizopogon luteolus. *Tul. Hyp.*

In the ground. Maungaroa (163), Bank's Peninsula.

Rhizopogon induratus. *Cke. sp. nov.*

Durissimus, depresso-globosus, fuscus, capillamentis paucis obvolutus; peridia crasso corneo, carne minutissime cellulosa (vix distincta) cinereo-fusca; sporis hyalinis, arcte ellipticis, binucleatis (0.07 x 0.03 mm.).

On the ground. Bank's Peninsula (403).

About one inch in diameter. When dry it is exceedingly hard, so that it can scarcely be cut; the surface then resembles buffalo horn.

Phoma nebulosum. *Berk. Outl., p. 314.*

On *Cruciferae*. Bank's Peninsula (331).

Phoma viridisporum. *Cke. sp. nov.*

Sparsum, cuticulâ nigro-factâ tectum. Peritheciis appianatis, sporis cylindrico-ellipticis, rectis, viridis (0.01 x 0.04 mm.).

On *Phormium*. Banks' Peninsula (328), Dunedin.

Sacidium Ixerbæ. *Cke. sp. nov.*

Epiphyllum, gregarium. Peritheciis atris, prominulis, nitidis. Sporibus sub-globosis, hyalinis (0.007×0.006 mm. vel exacte globosis).

On upper surface of leaves of *Ixerba brexioides*. Tuaranga (326).

Discella lignicola. *Cke. sp. nov.*

Sparsa, erumpens. Peritheciis punctiformibus, atris, demum apertis; disco fuligineo. Sporibus cylindræis, hyalinis (0.02×0.0035 mm.).

On naked wood. Dunedin (243).

Accompanied by a minute *Phoma*.

Dinemasporium graminum. *Ler. Ann. Sci. Nat., 1846, 274.*

On grasses. Banks' Peninsula (332).

Ceuthospora foliicola. *Lib. exs. sub. Cytispora.*

On leaves. Waitaki (252).

Bactridium magnum. *Cke. sp. nov.*

Pulvinatum, sub-hemisphericum, vel irregularis (1.5 mm.) pallidum. Sporibus clavatis, 5-9 septatis, magnis, hyalinis (0.3 mm. long, vel ultra).

On naked wood. Whangaroa (386); Waitaki (295); Mangaroa, Melbourne (Australia).

A more imposing species than *B. flavum*. There is no record of its colour in the living state.

Æcidium senecionis. *Desmz. Ann. Sci. Nat., 1836, p. 243.*

On *Senecio vulgaris*. Waitaki.

Ustilago urceolorum. *Tul. Ann. Sci. Nat., 1847, 102.*

On *Carex ternaria*. Lake Taupo, Tauranga (217).

Ceratium hydroides. *A. & S. Consp., t. 2, f. 7.*

On wood. Waitaki (65).

Ceratium roseum. *Cke. sp. nov.*

Roseum, gregarium; clavulis furcato-ramosis, brevibus. Sporibus ovalibus, hyalinis (0.012×0.01 mm.).

On rotten wood. Winton (113).

Although colourless when dried, the drawing which accompanied it gives distinctly the form, and bright rose colour. It nevertheless requires better knowledge of its life-history before its affinities become certain.

Ceratium fuscum. *Cke. sp. nov.*

Aurantium vel fuscum, gregarium; clavulis breviter ramosis, congestis, confluentibus. Sporibus sub-ellipticis, hyalinis (0.014×0.01 mm.).

On rotten wood. Waitaki (112, 297).

More compact than *C. roseum*, retaining a somewhat ferruginous colour when dry.

Cladosporium sphæroideum. *Cke. sp. nov.*

Punctiforme, atrum, gregarium, compactum. Cæspitulis hemisphericis, velutinis, atris. Hyphis dense fasciculatis, brevibus, septatis, sporisque olivaceis (sporibus $0.02-0.04 \times 0.007$ mm.).

On leaves of *Poa foliosa*. Canterbury Alps (398).

In habit resembling a *Sphæria* or *Venturia*.

Morchella conica. Pers. Cke. *Mycogr.*, t. 81, fig. 315.

On the ground. Wellington (Mr. Travers).

Gyromitra esculenta. Fr. Cke. *Mycogr.*, t. 89, f. 328.

On the ground. Wellington (Mr. Travers).

Leotia lubrica. Pers. Cke. *Mycogr.*, t. 44, f. 171.

On the ground. Melbourne (Australia).

Geoglossum glabrum. Pers. Cke. *Mycogr.*, t. 3, f. 9.

Var. **minor.**

On the ground. Waitaki (6).

Geoglossum Walteri. Berk. Cke. *Mycogr.*, t. 1, fig. 4.

On the ground (?) Melbourne (392).

Geoglossum hirsutum. Pers. Cke. *Micogr.*, t. 1, f. 3.

Var. **Leotioides.** Cke.

Clavulis inflatis, ovatis, depressis, vel collapsis.

On the ground. Winton (213).

The clubs collapse and overhang the stem, as in *Leotia*, but the fruit does not differ sufficiently to warrant its separation as a distinct species.

Peziza (Macropodes) bulbosa. Hedw. Cke. *Mycogr.*, t. 48, f. 189.

On the ground. Melbourne, Australia (394).

Peziza (Cochleatae) aurantia. Vahl. Cke. *Mycogr.*, t. 52, f. 203.

Var. **minor.**

On the ground. Waitaki (37).

None of the specimens an inch in diameter, yet there are no features which constitute a specific difference.

Peziza (Discina) lumbricalis. Cke. *sp. nov.*

Magna, cupulata, demum expansa, revoluta, applanata; extus subglabra, vel farinosa; intus pallido-fusca. Ascis longe attenuatis, cylindraceis (0.2 mm.). Sporidiis ellipticis, binucleatis ($0.1-0.12 \times 0.005$ mm.).

On the ground. Waitaki (72).

Cups 1 to 3 inches, or more, in diameter. Resembling *P. palmicola*, B. & C., but larger, and with different fruit.

Peziza (Humaria) carbonigena. Berk. Fl. Tasm. ii., 274, Cooke. *Mycogr.*, t. 8, f. 29.

Overrunning wood, moss, leaves, &c., on which it forms a membranaceous stroma upon which the cups are seated. Winton (124).

Peziza (Humaria) fusispora. Berk. Hook. Journ., 1846, p. 5. Cke. *Mycogr.*, t. 8, f. 32.

On the ground. Waitaki (?) (212).

Peziza (Sarcoscypha) Lusatiae. Cke. *Mycogr.*, t. 37, f. 146.

On wood. Waitaki (31, 32). On moss. Dunedin (205).

Peziza (Sarcoscypha) Dalmeniensis. Cke. *Mycogr.*, t. 39, f. 153.

On dung. Waitaki (117, 299), Melbourne, Australia (396).

Slightly differing in the hairs from the typical form, but apparently not specifically distinct.

Peziza (Sarcoscypha) badio-berbis. Berk. in Herb.

On rotten wood. Ohaeawai (206).

Resembling *P. scutellata* in size and general appearance, but with coarsely warted sporidia ($0.22-0.25 \times 0.12-0.14$ mm.), and very long marginal hairs.

Peziza Kerguelensis. *Berk. in Flor. Ant., p. 145. Cke. Mycogr., t. 34, f. 134.*

On the ground. Waitaki (274).

Peziza (Sarcoscypha) stercorea. *Pers. Cke. Mycogr., t. 38, f. 147.*
On dung. Waitaki (84).

Peziza Dasyscypha) flicea. *C. & Phil. sp. nov.*

Nivea, stipitata, sparsa; cupulis (0.1-0.2 mm.) parvulis, villosis, turbinatis, in stipitem brevem productis. Ascis clavato-cylindricis. Sporidiis fusiformibus, biserialis, guttulis, demum pseudo-septatis (0.15-0.2 × 0.02-0.03 mm.) Paraphysibus elongato-fusiformibus, acutis.

On ferns. Dunedin (400).

The hairs are septate, smooth, and granularly capitate.

Peziza (Dasyscypha) apala. *B. & Br. Ann. N. H., No. 561. Cke. Hdbk., No. 2060.*

On *Juncus*. Waitaki (272).

Peziza (Dasyscypha) glabrescens. *C. & Phil. sp. nov.*

Sparsa, stipitata, candida. Cupulis (0.5-1 mm.) cyathiformis, primitis subvillosis, demum nudis, glabris. Ascis clavatis. Sporidiis lanceolatis, utrinque rotundatis, guttulis (0.15-0.19 × 0.03-0.04 mm.) Paraphysibus filiformibus.

On *Rhipogonum* (?) Melbourne, (Australia 379).

Peziza (Dasyscypha) lanariceps. *C. & Phil. sp. nov.*

Sparsa, stipitata, ochraceo-fusca. Cupulis turbinatis, demum apertis (0.2 mm. diam.), villosis, granulis purpureis conspersis. Ascis clavatis. Sporidiis cylindricis, utrinque attenuatis (0.15-0.2 × 0.03 mm.) Paraphysibus elongato-fusiformibus, acutis.

On *Rhipogonum* (?) Melbourne, (Australia 363).

The external hairs are not more than one-twelfth of a millimetre long, rather rough, mixed with bright purple granules.

Peziza (Dasyscypha) nivea. *Fr. Sys. Myc. ii., p. 90.*

On rotten wood. Waitaki (286), Omatangi (314).

Peziza (Hymenoscypha) cyathoidea. *Bull. t. 316, f. 2. Cke. Hdbk., No. 2092.*

On fern stipes. Maungaroa (209).

Peziza (Mollisia) ventosa. *Karst. Myc. Fenn., p. 188.*

On rotten wood. Waitaki (303).

Peziza (Mollisia) hamatoidea. *C. & Phil. sp. nov.*

Sparsa, sanguineo-rubra, ceraceo-mollis, sessilis. Cupulis demum applanatis (1-1½ mm.), margin elevato. Ascis clavatis. Sporidiis cylindricis, utrinque attenuatis, guttulis (0.16 × 0.03-0.04 mm.) Paraphysibus filiformibus.

On decorticated wood. Waitaki (100).

Similar to *P. rubella*, P., but firmer, and with different fruit.

Peziza (Mollisia) cinerea. *Batsch. Cke. Hdbk., No. 2100.*

On rotten wood. Waitaki (79*).

Peziza (Mollisia) crispa. *C. & Phil. sp. nov.*

Aurantiaea, sparsa, sessilis (1-4 mm.). Cupulis concavis, crispis, subtus pallidior, tenuibus. Ascis cylindraceis. Sporidiis

linearibus (0.08×0.03 mm.), utrinque rotundatis. *Helotium crispulum*, MSS. in Herb.

On wood. Maungaroa (211).

Helotium Berggrenii. *C. & Phil. sp. nov.*

Phyllogenum, pallidum, stipitatum. Cupulis sparsis, cyathiformibus ($0.5-0.7$ mm.) Stipite gracili, æquali (circa $0.5-1$ mm.). Ascis cylindræis. Sporidiis ellipticis, nucleatis ($0.1-0.13 \times 0.03-0.05$ mm.) Paraphysibus filiformibus.

On dead leaves. Melbourne, (Australia 369).

Helotium claroflavum. *Berk. Cke. Hdbk., No. 2150.*

On wood. Melbourne, Australia (368), probably also Waitaki (281).

Helotium brevisporium. *C. & Phil. sp. nov.*

Ochraccum, sessile, sparsum ($1-3$ mm.). Cupulis appplanatis, concavis; margine pallido, elevato. Ascis cylindricis. Sporidiis breviter ellipticis, demum uniseptatis ($0.07-0.1 \times 0.03-0.04$ mm.) Paraphysibus linearibus.

On decorticated sticks. Waitaki (30 b).

Described with some hesitation as the specimen was small. It is therefore subject to future confirmation.

Helotium phormium. *Cke. sp. nov.*

Erumpens, pallidum, stipitatum. Cupulis clavatis, dein plano-concavis (0.5 mm.) difformibus. Stipite amplo, deorsum attenuato. Ascis clavatis. Sporidiis subclavatis, utrinque rotundatis, nucleatis, curvulis ($0.3-0.35 \times 0.05$ mm.).

On *Phormium tenax*. Maungaroa (388).

Helotium lacteum. *Cke. sp. nov.*

Sparsum, lacteum, sessile. Cupulis concavis ($2-3$ mm.), margine flexuoso. Ascis cylindræis. Sporidiis uniseriatis, lanceolatis, nucleatis ($0.2-0.3 + 0.04-0.06$ mm.) Paraphysibus filiformibus.

On very rotten wood. Maungaroa (387).

Diaphanous, milky white when fresh, ochraceous when dry.

Helotium citrinum. *Hedw. Cke. Hdbk., No. 2145.*

On rotten wood. Waitaki (30, 30 bis., 203, 53, 20), Dunedin 202), Winton (122), Maungaroa (233), Wellington (Travers, 361).

Var. pallidum.

Banks' Peninsula (329), Waitaki (287, 304, 298, 292, 38).

Chlorosplenium omnivirens. *Berk. in Fl. Tasm. Sub. Peziza.*

On rotten wood. Waitaki (29).

Resembling *C. æruginosum* in habit and external appearance, but the sporidia are $0.18-0.2$ mm. long, whilst in *C. æruginosum* they are about $0.06-0.07$ mm. long. In *C. ærugineum*, Berk., the sporidia are about $0.1-0.12$ mm. long. In *C. æruginellum*, Karst., they are stated to be $0.07-0.12$ mm. long. In *C. æruginosum*, Karst., they are described as $0.1-0.14$ mm. long—which is not our *C. æruginosum*, the latter being probably *C. æruginascens*, Karst., with sporidia $0.06-0.08$ mm. long.

Ascobolus furfuraceus. Pers. *Cke Hdbk.*, No. 2200.

On dung, with *Peziza stercorea*. Waitaki (84).

Bulgaria sarcoides. Fr. *Syst. Myc.* ii. 168. *Cke. Hdbk.*, No. 2218. Spermatia.

On wood. Melbourne (Australia), Waitaki (69), Winton, Winton (119), with asci.

Ombrophila violacea. Fr. *Sum. V. Scan.* Var. **australis.**

On twigs, &c. in swampy places. Melbourne, Australia (401).

Not differing from the type in fructification, but with a longer flexuous stem, and apparently more cinereous.

Cyttaria Gunnii. Berk. in Hook. *Lond. Jour.*, 1848, 576.

On trunks. Wellington (Travers).

BERGGRENIA. *Cke.*

Carnosa, inflata, subsessilis, intus hymenio effuso obducta. Sporidiis amplis, ascigeris. *Gard. Chron.*, Oct., 1879.

Berggrenia aurantiaca. *Cke. sp. nov.*

Obovata, vel spathulata, sessilis, aurantiaca, ad basin plicata, demum rupta. Ascis cylindraceis. Sporidiis amplis, ellipticis, hyalinis ($0.22-0.25 \times 0.16-0.18$ mm.).

On wood. Waitaki (55, 68).

Dermatea fumosa. C. & Ph. *sp. nov.*

Sparsa, sessilis. Cupulis demum expansis (2-4 mm.), extus pallidis, granulosis, margine elevato, flexuoso. Hymenio murinaceo. Ascis clavatis, longe stipitatis. Sporidiis lanceolatis, rectis vel curvulis, endochromate quinque-divisis ($0.25-0.35 \times 0.04-0.06$ mm.)

On rotten wood. Dunedin (207).

Stictis virginea. C. & Phil. *sp. nov.*

Sparsa, erumpens, nivea. Matrice stellata-fissurato ($0.05-0.08$ mm.) Ascis cylindraceis. Sporidiis filiformibus (0.25 mm.). Paraphysibus filiformibus, flexuosis.

On twigs. Waitaki (289).

A very neat and distinct species.

Stictis punctiformis. Pers. *Syn.*, 674.

On naked wood. Waitaki (283, 288).

Hysterium phormigenum. *Cke. sp. nov.*

Sparsum, erumpens, tenue. Peritheciis elongato-ellipticis, parallelis; labiis erosis, rigentibus, tenuibus, atris; disco cinereo. Ascis clavatis. Sporidiis ellipticis, uniseptatis, brunneis ($0.02-0.025 \times 0.008$ mm.).

On *Phormium tenax*. Winton (390).

A singular species, with no immediate allies.

Cordyceps Robertsii. Berk. in Fl. N. Zeal. ii., 202.

On larvæ.

Claviceps purpurea. Tul.

On grasses. Auckland.

Only the *Sclerotium* represented.

Hypocrea vinosa. *Cke. sp. nov.*

Orbicularis, convexa, atro-vinosa (2-3 mm.), ostiolis vix distincta. Ascis cylindraceis. Sporidiis dissilientibus, cellulis subglobosis ($\cdot 306\text{--}\cdot 007$ mm.), hyalinis.

On dead wood. Waitaki (307).

Sporidia larger than in *H. rufa*, which it somewhat resembles in habit.

Hypocrea Berggreni. *Cke. sp. nov.*

Erumpens, discoidea, umbrino-vinosa (2 mm.), intus pallida, sæpe gregaria. Peritheciis nec non perfecte evolutis.

On branches.

This is certainly an *Hypocrea*, very similar in character to *H. Richardsoni*, Berk., although no fructification or even perfect perithecia could be found. It is very distinct, externally resembling, at a superficial glance, *Diatrype disciforme*, in the size and form of the stroma, and habit of growth.

Nectria Zealandica. *Cke. sp. nov.*

Cæpitosa, testaceo-rubra, erumpens. Cæspitulis convexis. Peritheciis subglobosis, lævibus, papillatis, mox depressis, vel concavis. Ascis clavatis. Sporidiis biseriatis, ellipticis, uniseptatis, constrictis, hyalinis ($\cdot 02\text{--}\cdot 025 \times \cdot 008\text{--}\cdot 01$ mm.).

On bark. Little River, Banks' Peninsula (305), Maungaroa (321).

Closely allied to *N. pulcherrima*, B. & Br., but perithecia darker, and sporidia rather smaller.

Nectria quisquiliaris. *Cke. sp. nov.*

Sparsa, succinea, vel subaurantia. Peritheciis lævibus, hinc illic congestis, nec cæspitosis. Ascis cylindraceis. Sporidiis uniseriatis, ellipticis, uniseptatis, vix constrictis ($\cdot 016\text{--}\cdot 02 \times \cdot 008$ mm.). Conidiis in stromate tuberculoideis enatis, elongato-ellipticis, nucleatis, hyalinis ($\cdot 012\text{--}\cdot 014 \times \cdot 004$ mm.).

On the outside and inside of fallen bark, fragments of wood, &c. Dunedin (123, conidia), Melbourne, (Australia 389, 362).

Nectria coccinea. *Fr. Sys. Myc. ii., 412.*

On branches. Dunedin (306).

Nectria sanguinea. *Fr. Sys. Myc. ii., 453.*

On bark. Wellington (Travers).

Nectria Otagensis. *Curr. Roy. Soc. Edin.*

On bark. Dunedin, Waitaki (208).

Nectria illudens. *Berk. Fl. N. Zeal. ii., 203.*

On bark. Waitaki.

Xylaria corniformis. *Mont. Ann. Sc. Nat., 1855, 104.*

On branches. Waitaki (5).

Xylaria castorea. *Berk. in Fl. N. Zeal., t. 105, f. 11.*

On dead wood. Wellington (Mr. Travers).

Xylaria rhytidophlæa. *Mont. Ann. Sci. Nat., 1855, 101.*

On wood. Melbourne (Australia, 402).

Xylaria apiculata. *Cke. sp. nov.*

Simplex, gracilis, stipitata, atra. Capitulis cylindricis, superne apiculatis. Peritheciis prominulis, papillatis; stipite velutino. Ascis cylindraceutis. Sporidiis uniseriatis, lanceolatis, subcurvulis, atro-brunneis ($\cdot 02\text{--}\cdot 022 \times \cdot 007$ mm.).

On wood. Maungaroa (214).

The stem from 1 inch to $1\frac{1}{2}$ inches long, the capitulum about half an inch long and 1 line diameter, surmounted by a distinct spine-like apiculus.

Xylaria Zealandica. *Cke. sp. nov.*

Simplex, gracilis, stipitata, atra. Capitulis cylindricis, rugosis, supra obtusis. Stipite glabro, canaliculato, convolutio. Ascis cylindraceutis. Sporidiis late fusiformibus, uninucleatis, atro-brunneis ($\cdot 032\text{--}\cdot 035 \times \cdot 01$ mm.).

On dead wood. Wellington (Travers).

Only one specimen in the collection. Stem 1 inch to $1\frac{1}{2}$ inches long, grooved longitudinally, and twisted. Capitulum three-quarters of an inch long, reticulated; ostiola minute, following the reticulations.

Xylaria tuberiformis. *Berk. in Fl. N. Zeal., t. 105, f. 11.*

On dead wood. Bay of Islands (215), Winton (224).

Cornelia uberata. *Fr. Sys. Myc. ii., 535.*

On *Podocarpus totara*. Little River (235).

Hypoxyton concentricum. *Fr. Sys. Myc. ii., 231.*

On stumps, &c. Coromandel, Bank's Peninsula, Waitaki, Wellington (Travers).

Hypoxyton exutans. *Cke. Linn. Journ. xvii., 143. Sub Diatrype.*

On bark. Maungaroa (240).

Hypoxyton semi-immersum. *Ntke. Pyr. Germ., p. 50.*

On rotten wood. Winton (225).

Hypoxyton annulatum. *Mont. Syll., 213.*

On bark. River Bealey, Canterbury Alps (249).

Hypoxyton allantoideum. *Cke. sp. nov.*

Parallelum, convexo-planum, atrum, elongatum, utrinque truncatum. Ostioliis punctiformibus; intus fuligineo-atris. Ascis cylindraceutis. Sporidiis arete ellipticis, continuis, atro-brunneis, ($\cdot 012\text{--}\cdot 014 \times \cdot 0045$ mm.).

On naked wood. Waitaki (250).

Melogramma gyrosa. *Tul. Carp. ii., 89.*

Spermatia only.

On bark. Little Island (247), Maungaroa (321), Winton (227), Dunedin (246).

Diatrype glomeraria. *Berk. Fl. N. Zeal., t. 106, f. 13.*

On *Rhipogonum*. Waitaki (253), Dunedin (244 and 245), Maungaroa (239), Little River (248), Wellington (Travers, 364).

Massaria australis. *Cke. sp. nov.*

Sparsa, tecta, inconspicua. Peritheciis depressis. Ascis clavatis. Sporidiis lanceolatis, uniseptatis, constrictis, brunneis ($\cdot 045\text{--}\cdot 05 \times \cdot 012\text{--}\cdot 014$ mm.). Stylosporis consortis, clavatis, 3-5 septatis, brunneis ($\cdot 05 \times \cdot 014$ mm.), hyalino-stipitatis.

On bark. Melbourne (Australia, 367).

The stylospores are of the nature of a *Coryneum*.

Sordaria curvula. *Winter. var. coronata.*

On dung with *Peziza* (No. 299).

Psilosphaeria mammæformis. *Pers. Syn., p. 64. Sub Sphaeria.*

On wood. Maungaroa (238), Waitaki (277 and 250?).

Psilosphaeria mammoidea. *Cke. sp. nov.*

Sparsa, denudata. Peritheciis subglobosis, ad basin applanatis, atris, glabris, nitidis. Ascis cylindraceis. Sporidiis ellipticis, continuis, brunneis ($\cdot 016\text{--}\cdot 018 \times \cdot 008$ mm.).

On rotten wood. Wellington (Mr. Travers).

Lasiosphaeria ovina. (*Pers.*) *Cke. in Grevillea vii., 85. Sphaeria ovina. Pers. Syn. p. 71.*

On branches and wood. Melbourne (Australia), Waitaki (251), Dunedin (234).

Sphaeria tenacis. *Cke. sp. nov.*

Sparsa, punctiformis, tecta. Peritheciis subglobosis, depressis. Ascis cylindraceis, stipitatis. Sporidiis ellipticis, continuis ($\cdot 01 \times \cdot 005$ mm.), brunneis.

On *Phormium tenax*. Waitaki (391 bis.).

Sphaeria (Caulicolæ) cardulcola. *Cke. sp. nov.*

Sparsa, tecta. Peritheciis subglobosis, elevatis, atris, demum epidermide perforatis. Ascis subcylindricis. Sporidiis ellipticis, uniseptatis, constrictis ($\cdot 015\text{--}\cdot 018 \times \cdot 007$ mm.).

On *Carduus lanceolatus* (?) Maungaroa (316).

Sphaeria (Pleospora) Zealandica. *Cke. sp. nov.*

Sparsa, erumpens. Peritheciis globosis, atris, epidermide fissurato cinctis. Ascis amplis, clavatis. Sporidiis subclavatis, obtusis, septatis, muriformibus, fuligineis ($\cdot 03\text{--}\cdot 032 \times \cdot 016$ mm.).

On *Phormium tenax*. Waitaki (391).

The sporidia are not constricted, and their general form differs from those of *S. australis*.

Sphaeria (Pleospora) herbarum. *Pers. Syn., p. 79. Cke., Hdbk. No. 2692.*

On grasses. Tauranga.

Sphaeria (Pleospora) australis. *Cke. sp. nov.*

Sparsa, erumpens. Peritheciis globosis, atris, prominulis, lævibus. Ascis clavatis. Sporidiis biserialis, sublanceolatis, obtusis, multiseptatis, muriformibus, olivaceo-fuscis ($\cdot 03 \times \cdot 012$ mm.).

On herb stems. Taupo (242).

Variety with larger sporidia ($\cdot 035 \times \cdot 015$ mm.). Tuaranga (397).

Pyrenophora nuda. *Cke. sp. nov.*

Sparsa, cuticulâ nigrofactâ tecta, glabra; cellulis, brunneis. Ascis clavatis. Sporidia biseriatis, ellipticis, medio constrictis, brunneis, septatis, muriformibus ($\cdot 03 \times \cdot 015$ mm).

On leaves of grass. Tauranga (399).

There are no true perithecia. The cells surrounding the perithecial cavity are brown, globose, and readily separable.

Microthyrium microscopicum. *Desm. Ann. Sci. Nat.*, 1841, t. 14, f. 1.

On leaves of *Dacrydium*. Maungaroa (322, 323).

Erysiphe densa. *Berk. in Fl. N. Zeal.*, t. 106, f. 16.

On leaves of *Aristotelia*. Dunedin, Waitaki (296).

Meliola amphitricha. *Fr. Berk. in Fl. N. Zeal. ii.*, 209.

On leaves. Melbourne (381).

ON THE PROPAGATION OF *SPHÆRIA* (*GNOMONIA*) *FIMBRIATA* (PERS.).

By CHARLES B. PLOWRIGHT.

In December, 1878, I planted in my garden two small specimens of hornbeam (*Carpinus betulus*), which were found growing in a hedge, and had still attached to their branches the withered leaves plentifully attacked by the *Sphæria*. Owing to their removal, the old leaves of these shrubs fell off, and were blown away long before the green leaves burst their buds in spring, which did not take place until the end of May.

On the 1st June, I tied four fragments of a leaf, each of which contained a cluster of perithecia with mature sporidia in them, upon four places, on one of the hornbeams. It was found most convenient to attach these fragments between the leaves of a terminal bud, and to retain them *in situ* by a twist or two of sewing cotton. The experiment was watched from time to time, but it was not until the 12th July that anything was observed. On this day, however, numerous minute black specks were visible upon the leaves experimented upon. The cotton was then unwound and the infecting fragments removed. In due course the black spots developed into typical specimens of *Sphæria fimbriata*. The hornbeams have been under observation ever since, but up to the present time (November) no further development of the *Sphæria* has taken place. This is the more noteworthy because the shrub which was not subject to experiment had, when first planted, the greater number of affected leaves upon it, but on not a single leaf has the parasite shown itself this year; nor on the other hornbeam has a single perithecium developed itself, save at the points inoculated.

I have thus the pleasure of confirming my friend, Dr. Max Cornu's conclusion, that these ascigerous parasites are confined to

the deciduous foliaceous organs, which he arrived at in experimenting with *Rhytisma acerinum*.*

These observations are not without interest in showing the connection which exists between the *Phacidiacei* and the *Sphæriacei*, physiologically as well as structurally, and afford an explanation of the abundance of *Sphæria fimbriata* where it occurs, as compared with the allied species, *S. coryli*; the hornbeam being a tree in which the dead leaves remain attached to the twigs, as a general rule, well through the winter and into the spring, until the sporidia arrive at their most perfect state of maturity.

NATAL FUNGI.

By M. C. COOKE.

The following is an enumeration of a small collection of Fungi in the Kew Herbarium, communicated from Natal by J. M. Wood. The Agaricini have been determined by Herr C. Kalchbrenner. There are a few numbers still to be examined:—

Agaricus (Leplota) sulfurellus. *Kalch.*

Totus sulfureus. Pileus e convexo planus, umbonatus, vix pollicem latus, in umbone umbrinus, ceterum squamulis verrucæformibus, sparsis, umbrinis notatus, margineque striatus, stipes tenuis, fistulosus, æqualis, glaber. Annulus membranaceus, pendulus. Lamellæ approximatae, vix confertæ, ventricosæ. Sporæ late ovatae, 0.006×0.0035 mm.

Port Natal. No. 387.

The paper in which the dried specimens were enclosed was stained of a bright yellow.

Agaricus (Clitocybe) sinopicus. *Fr. Hym. Eur.*, 95.

In woods.

No. 395.

Agaricus (Collybia) macilentus. *Fr. Ep.* 11., p. 123.

On the ground.

No. 401.

Agaricus (Pleurotus) perpusillus. *Fr. Hym. Eur.*, 181.

On trunks.

No. 191.

Agaricus (Pholiota) unicolor. *Fl. Dan.*, t. 1071, fig. 1.

On trunks.

No. 390 (pusio).

Agaricus (Psilocybe) squalens. *Fr. Hym. Eur.*, 303.

About trunks.

No. 383.

Agaricus (Panæolus) pepilionaceus. *Fr. Hym. Eur.*, 311.

On the ground.

Nos. 385, 379, 391, 397.

Agaricus (Psathyrella) subtilis. *Fr. Hym. Eur.*, 316.

On dung.

No. 382.

* "Comptes Rendus," July, 1878. Translated by Mr. T. Howse, "Grevillea," Vol. vii., p. 101.

- Agaricus (Psathyra) disseminatus.** *Fr. Hym. Eur.*, 316.
On trunks. No. 400 prox.
- Coprinus niveus.** *Fr. Hym. Eur.*, 325.
On dung. No. 384.
Nos. 377, 388, 389. Indeterminable.
- Polyporus (Pleuropus) affinis.** *Nees. Fr. Epic.*, 445.
On trunks. No. 419.
- Polyporus (Pleuropus) flabelliformis.** *Klotsch. Fr. Epic.*, 444.
On trunks. No. 422.
- Polyporus (Pleuropus) rhipidius.** *Berk. Hook. Journ.*, 1847, 319.
On branches. No. 351.
- Polyporus**—sterile and indeterminable.
On wood. No. 427.
- Cladoderis australica.** *Berk.*
On trunks. No. 239.
- Stereum nitidulum.** *Berk. in Hook. Jour.*, 1843, p. 639.
On sticks. No. 396.
- Tremella lutescens.** *Fr. Epic.*, 588.
On branches. No. 398.
- Hirneola fusco-succinea.** *Mont. Syll.*, p. 181.
On trees. No. 108.
- Hirneola auricula-Judæ.** *Fr. Hym. Eur.*, p. 695.
On trees. No. 412.
- Cyathus Pöppigii.** *Tul. Mem. Nid.*, t. 4, f. 23-25.
On the ground and wood. No. 334.
- Podaxon circinomalis.** *Fr. Sys. Myc. iii.*, p. 62.
A small form. No. 405.
- Broomela congregata.** *Berk. in Hook. Lond. Jour. iii.*, 193.
On wood. No. 426.
- Scleroderma vulgare.** *Fr. Sys. Myc. iii.*, p. 46.
On the ground. No. 374.
- Scleroderma bovista (?)** *Fr. Sys. Myc. iii.*, 48.
Too immature for certain identification.
On the ground. No. 369.
- Arcyria punicea.** *Pers. Cke. Brit. Myx.*, p. 69.
On wood. No. 322.
- Physarum cinereum.** *Batsch. (?) Cke. Brit. Myx.*, p. 13.
In very bad condition.
On bark. No. 425.
- Darluca filum.** *Cast. Cke. Hdbk.*, 1285.
On *Uredo phaseolorum*. No. 89.
- Æcidium stobæ.** *K. & C.*
Peridiis (3-5) in cæspitulis congestis, albis. Margine fimbriato-laceratis. Sporis hyalinis, subglobosis (.028-.03 mm.).
On leaves of *Stobæa*. Natal. No. 63.
The peridia resemble in form those of *Ræstelia lacerata*, but are snowy white. The large spores are probably coloured when fresh—but this cannot be determined from the dried specimens. The

cells of the peridium are much elongated. It is succeeded by *Puccinia stobæa*, MacOwan.

***Æcidium aroideum.* Cke.**

Peridiis in cæspitibus congestis, parvulis, semi-immersis; margine leniter dentato. Sporibus subglobosis, lævibus, $\cdot 015\text{--}\cdot 018$ mm., coloratis.

On leaves of *Stylochiton*.

No. 114.

Apparently distinct from *Æcidium ari*, B. The colour of the spores when fresh is not indicated.

***Æcidium vignæ.* Cke.**

Peridiis sparsis, semi-immersis; margine albo dentatis. Sporibus lævibus, subglobosis, $\cdot 015\text{--}\cdot 017 \times \cdot 02\text{--}\cdot 022$ mm., coloratis.

On leaves of *Vigna marginata*.

No. 407.

Spores probably yellow. The peridia occupy the greater portion of leaf or stipule, and hence distinct from other described species on *Leguminosæ*.

***Trichobasis cichoracearum.* Lev. Ann. Sci. Nat. Cke. Hdbk., 1482.**

On *Bidens pilosa*.

No. 230.

***Trichobasis labiatarum.* Lor. Ann. Sci. Nat. Cke. Hdbk., 1474.**

On *Leucas*.

No. 5.

***Uredo phaseolorum.* DBy. Ann. Sci. Nat.**

On *Phaseolus*, in gardens.

No. 89.

The Uredo form of *Uromyces phaseolorum*, DBy.

***Uredo macrospermum.* Cke. sp. nov.**

Hypophyllum, sparsum. Soris hemisphericis, aurantiacis, demum pallescentibus. Sporibus sub-lanceolatis, utrinque obtusis, lævibus ($\cdot 045 \times \cdot 016\text{--}\cdot 018$ mm.).

On *Pteris*.

No. 61.

This species was originally determined on fronds of *Onoclea*, from the United States.

***Puccinia Africana.* Cke.**

Pustulis compactis, minimis, in cæspitibus circinantibus; sporibus clavatis, vel fusiformibus, constrictis, fuscis, $\cdot 05 \times \cdot 015$ mm., episporio supra incrassato. Pedicellis hyalinis, persistentibus.

On leaves of *Spilanthes Africana*.

No. 200.

The Uredo-spores are at present unknown.

***Puccinia purpurea.* Cooke in *Grevillea* V., p. 14.**

On *Sorghum*.

No. 229.

The Uredo form only.

***Puccinia momordicæ.* Kalch. MSS.**

On leaves of *Momordica*.

No. 141.

Spores $\cdot 035\text{--}\cdot 04 \times \cdot 25$, deeply constricted, dark brown; episporium reticulated. Identical with specimens under the above name from Herr Kalchbrenner.

Uromyces circinalis.* Kalch. & Cke., in *Herb. Kalchb.

Amphigenum. Soris minimis, circinatis, vel sparsis, purpureo-fuscis. Sporibus ovalibus, vel subovatis, lævibus ($\cdot 02\text{--}\cdot 025 \times \cdot 015\text{--}\cdot 018$ mm.); pedicellis hyalinis, tenuibus, deciduis.

On leaves.

No. 231.

Uromyces Thwaitesii. Berk. & Br., in *Ceylon Fungi*, No. 824.
On *Sida*. No. 406.

Cercospora leonitidis. Cke. sp. nov.

Hypophylla. Maculis fuscis. Hyphis brevibus, tenuibus, hyalinis, sparsis, simplicibus. Sporidis cylindræis, superne attenuatis, hyalinis, 3-septatis ($\cdot 04\text{--}\cdot 05 \times \cdot 003$ mm.).

On leaves of *Leonitis ovata*. No. 5.

Dermata rufa. Cke. sp. nov.

Sparsa, erumpens, fusco-rufa, carnosio-coriacea. Cupulis in stipitem brevem productis, disco excavato, rufo ($\cdot 12\text{--}\cdot 3$ mm.); extus farinaceo, aureo-fusco; carne concolori. Ascis clavatis. Sporidiis fusiformibus, rectis vel curvulis ($\cdot 035\text{--}\cdot 04 \times \cdot 005\text{--}\cdot 006$ mm.); quadrinucleatis, hyalinis. Paraphysibus filiformibus.

On bark. No. 400.

When moistened for examination, a golden-brown stain was communicated to the paper on which the cups were placed. There is no intimation whether there is any coloured juice in the fresh specimens.

Hypocrea lycogalæ. Kalch. & Cke., in *Herb. Kalch.*

Rufo-brunnea, intus alba, orbicularis, vel irregulariter lobata, depressa. Peritheciis vix visibilis, minimis. Sporidiis articulis globosis, hyalinis $\cdot 0035\text{--}\cdot 004$ mm.

On rotten wood, &c. No. 399.

This is the lobed form, whereas the typical Cape form resembles a small *Lycogala*. In other respects they appear to be identical.

Xylaria hypoxylon. Fr. *Sys. Myc. ii.*, 327.

Conidia only.

On stumps. No. 342.

No. 324 is a sterile *Xylaria* indeterminable.

Xylaria rhopaloides. Mont. Berk. *Cuban Fungi*, No. 790.

Conidia only.

On stumps. No. 346.

Poronia punctata. Fr. *Sys. Myc. ii.*, 330.

On dung. No. 404.

Dothidea repens. (Corda). Berk. *Hook. Journ.*, 1854, 231.

On leaves. No. 228.

Dothidea perisporioides. Berk. & C. N. *Amer. Fungi*, No. 880.

On leaves. No. 115.

Meliola polytricha. Kalch. & Cke., in *Herb. Kalchb.*

Hypophylla, vel amphigena, atra, maculæformis. Mycelio effuso, radiato, conidiifero. Conceptaculis globosis; appendiculis erectis, simplicibus, acutis, plerumque flexuosis. Sporangiis ovatis. Sporidiis cylindricis, obtusis, 4-septatis, constrictis, atrobrunneis. Conidiis clavatis, 3-5 septatis ($\cdot 05 \times \cdot 008$ mm.), in hyphis erectis flexuosis gerentibus.

On leaves. No. 222.

Conceptacles about one-fifth of a millimetre in diameter. The conidia greatly resemble some species of *Helminthosporium*.

NOTE ON CALIFORNIAN SPHÆRIÆ.

"GREVILLEA," Vol. VII., p. 73.

The plant described by me under the name, *Sphæria propagata*, I have reason to believe is only a form of Schweinitz' *Valsa Vitis*, from which it differs in habit, &c., but not sufficiently so as to be worthy of regard as a distinct species.

By an error in the same paper, the term "ovate" is used instead of "oval" in the description of the sporidia of *Sphæria arctostaphylos*, *sustenta*. and *sambuci*.

CHARLES B. PLOWRIGHT.

WOOLHOPE CLUB, 1879.

The annual meeting of the Woolhope Club commenced this year on the 29th September, at Hereford. A full report of the proceedings during the week will be found in the "Gardener's Chronicle" for October.

In quantity the fungi by no means equalled that of previous years, but in objects of interest the meeting was quite on an equality with its predecessors. The following list does not include the commonest species which may be met with anywhere, but only those worthy of note in an exceptional year. The species found in Great Britain for the first time are accompanied by descriptions, and these may be regarded as a continuation of our records of "New British Fungi."

The presence of the Rev. M. J. Berkeley, Dr. Quelet, Mons. E. Boudier, and Dr. Maxime Cornu, in addition to the usual visitors, will account for the detection of so many additional species.

Agaricus (*Amanita*) *pantherinus*, Fr. Cabalva.

" " *vaginatus*, Fr. Dinmore.

" " *spissus*, Fr. Foxley.

***Agaricus* (*Tricholoma*) *atrocinereus*. P.**

Between rigid and fragile; pileus fleshy, convex then plane, at length cracked; disc prominent and darker; stem stuffed, equal, smooth, whitish; gills arcuate adnexed, ventricose, whitish.—Fr, *Icon.*, t. 31, f. 2.

In grassy places. Foxley.

Agaricus (*Tricholoma*) *albobrunneus*, Fr. Holm Lacy.

" " *cinerascens*, Fr. Holm Lacy.

" " *terreus*, Fr. Dinmore.

" " *saponaceus*, Fr. Cabalva.

" (*Lepiota*) *seminudus*, Lasch. var. *lilacinus*. Holm Lacy.

" " *carcharias*, P. Foxley.

" (*Clitocybe*) *metachrous*, Fr. Dinmore, Foxley.

" " *inversus*, Sow. Foxley.

Agaricus (Clitocybe) amarus. *Fr.*

Pileus fleshy, convex then plane, obtuse, dry, flocculose, rufescent; stem solid, tough, floccose, becoming smooth, white; gills slightly decurrent, crowded, narrow, white.—*Fr. Hym.*, p. 83.

In woody places. Holm Lacy.

Agaricus (Collybia) xanthopus, *Fr.* Foxley.

„ „ conigenus, *Pers.* Holm Lacy.

„ „ cirrhatus, *Sch.* Cabalva, Foxley.

„ „ caulicinalis, *Bull.* Cabalva.

Agaricus (Collybia) extuberans. *Batt.*

Pileus rather fleshy, convex then expanded, umbonate; margin slightly inflexed; stem hollow, thin, equal, straight, rooting, smooth, even; gills nearly free, crowded, narrow, white.—*Fr. Icon.*, t. 67, f. 1.

On the ground and trunks. Foxley.

Agaricus (Collybia) laxipes. *Fr. Hym.*, p. 115.

Pileus rather fleshy, flattened, convex, obtuse, smooth, moist; stem stuffed, velvety rufous, lax, very long; gills free, seceding, distant, broad, ventricose, milk white.—*Quel. Jur.* ii., t. 2, f. 2.

On chips. Holm Lacy.

Agaricus (Collybia) butyraceus, *Fr.* Dinmore.

„ „ platyphyllus, *Fr.* Dinmore.

„ „ inolens, *Fr.* Cabalva.

„ „ rancidus, *Fr.*

„ (Mycena) parabolicus, *Fr.* Foxley.

„ „ acicula, *Schff.* Foxley.

„ „ pelianthinus, *B.* Foxley.

„ „ vulgaris, *Fr.* Foxley.

Agaricus (Mycena) sudorus. *Fr.*

Pileus rather membranaceous, convex, umbonate, striate, viscid; stem firm, rooting, even, dry, rather smooth; gills obtuse and adnate with a tooth, somewhat thick, rather distant, white then flesh colour.—*Fr. Hym.*, 138.

On beech trunks. Foxley.

Agaricus (Mycena) lineatus. *Bull.*

Pileus membranaceous, campanulate, obtuse, smooth, wholly striate in lines; stem thin, even, whitish-villous downwards; gills adnate, rather distant, white.—*Bull. Champ.*, t. 522; *Fr. Hym.*, p. 134; *Fr. Icon.*, t. 78, f. 5.

Amongst moss. Foxley.

Agaricus (Mycena) stanneus. *Fr. Hym.*, 143.

Firm. Pileus membranaceous, campanulate, then expanded, smooth, obsoletely striate, hygrophanous, even when dry, beautifully silky; stem smooth, even, shining, becoming pale, at length compressed; gills adnate with a decurrent tooth, connected by veins, greyish-white.—*Fr. Icon.*, t. 82, f. 2.

Amongst grass in woods. Cabalva.

Agaricus (Mycena) roridus, *Fr.* Cabalva.

„ „ tenerrimus, *B.* Foxley.

Agaricus (Mycena) coccineus. *Sow., t. 197.*

This has hitherto been referred to *Ag. strobilinus*, Fr., but it proves to be quite distinct. The gills are not at all darker at the margin.

On fir cones and twigs. Dinmore.

Agaricus (Mycena) speireus, Fr. Dinmore.

„ „ *vitis*, Fr. Dinmore.

„ „ *vitreus*, Fr. Dinmore.

„ (*Omphalia*) *fibula*, Fr. Cabalva.

„ „ *campanella*, Batsch. Cabalva.

„ (*Pleurotus*) *tremulus*, Schff. Holm Lacy.

„ (*Pluteus*) *cervinus*, Schff. Cabalva.

„ „ *chrysophæus*, Schff. Cabalva.

Agaricus (Leptonia) chloropolius. *Fr.*

Pileus membranaceous, convex, then flattened, striate, livid, with black scales in the centre; stem fistulose, slender, even, smooth, bluish, turning greenish; gills adnate, pallid.—*Fr. Hym.*, 205.

In grassy places. Cabalva.

Agaricus (Nolanea) inamænus, Fr. Cabalva.

„ „ *pascuus*, P. Cabalva.

„ (*Eccilia*) *atropunctus*, P. Dinmore.

„ (*Claudopus*) *variabilis*, Fr. Dinmore.

„ (*Pholiota*) *mycenoides*, Fr. Cabalva.

„ „ *marginatus*, Batsch. Dinmore.

„ „ *radicosus*, Bull. Dinmore.

„ „ *mutabilis*, Schff. Dinmore.

„ (*Hebeloma*) *mesophæus*, Fr. Dinmore, Cabalva.

Agaricus (Hebeloma) mussivus. *Fr. Hym.*, 237.

Pileus fleshy, convex, then plane, obtuse, viscid, at length squamulose; stem solid, equal, thick, wholly fibrillose, rather pruinose at the apex; gills emarginate, rather crowded, yellowish.

In pine woods.

Agaricus (Hebeloma) petiginosus. *Fr. Hym.*, 243.

Pileus rather fleshy, conical or convex, then expanded, dry; disc swollen, brown, circumference silky grey; stem stuffed, tough, slender, pulverulent, brick-red; gills free, ventricose, yellow, then olive bay.

On the ground in beech woods. Cabalva.

Pileus about half an inch broad.

Agaricus (Inocybe) lucifugus, Fr. Cabalva.

„ „ *scabellus*, Fr. Cabalva.

„ „ *fastigiatus*, Fr. Foxley, Cabalva.

„ „ *lacerus*, Fr. Cabalva.

„ „ *pyriodorus*, Fr. Foxley.

„ „ *dulcamarus*, Pers. Dinmore.

„ „ *euthelus* B. & Br.

„ „ *geophyllus*, Fr. Foxley, &c.

Agaricus (Inocybe) asterosporus. *Quel.*

Scarcely distinguishable from *Agaricus rimosus*, except in the form of the spores, which are globose and spinulose, so as to appear stellate (.012 mm. diam.).—*Quelet in Bull. Soc. Bot. Fr.* xxvi., p. 50.

On the ground in woods. Foxley.

Agaricus (Inocybe) hirsutus. *Lasch.*

Pileus rather fleshy, conic campanulate, acute, squarrose with scales of fasciculate hairs; stem solid, slender, fibrillose, scaly at the apex, greenish at the base; gills adnexed, narrow, pallid then brown.—*Fr. Hym. Eur.*, 227.

In moist beech woods. Foxley.

Agaricus (Flammula) inopus, *Fr.*

„ (*Crepidotus*) *mollis*, *Fr.*

„ (*Naucoria*) *cucumis*, *Fr.* Holm Lacy.

„ „ *escharodes*, *Fr.* Dinmore.

„ (*Galera*) *hypnorum*, *Batsch.*

„ (*Stropharia*) *ærginosus*, *Curt.*

„ „ *squarrosus*, *Fr.* Foxley.

„ (*Hypholoma*) *epixanthus*, *Fr.* Dinmore.

„ „ *capnoides*, *Fr.* Dinmore.

„ „ *hydrophilus*, *Bull.*

„ (*Psathyra*) *corrugis*, *Fr.* Cabalva.

„ „ *conopileus*, *Fr.* Foxley.

„ (*Panaeolus*) *sphinctrinus*, *Fr.* Cabalva.

„ (*Psathyrella*) *disseminatus*, *Fr.* Dinmore.

Coprinus sociatus. *Fr. Hym.*, 331.

Pileus very thin, ovate, then campanulate, soon splitting, with radiating folds, mealy, brown, growing pale; disc umber, at length umbilicate; stem attenuated, smooth, white; gills adnexed to a ring, cinereous, then black.

On damp soil. Cabalva.

Bolbitius titubans, *Fr.* Cabalva.

Cortinarius (Phlegmacium) multiformis, *Fr.* Cabalva.

„ „ *purpurascens*, *Fr.* Holm Lacy.

Cortinarius (Phlegmaum) largus. *Fr. (fide Quelet).*

Pileus fleshy, dilated, repand, rather thick, coated with adpressed silky fibrils, slightly viscid, flesh bluish grey then white; stem solid, fibrillose, curved, violaceous, becoming whitish, pruinose at the apex; gills adnate, emarginate, broad, crowded, quite entire, bluish grey, then clay-coloured cinnamon.—*Fr. Hym.*, 339; *Grevillea t.* 103, f. 1.

In pine woods.

Cortinarius (Myxacium) Riederi. *Fr. Hym Eur.*, 339.

Pileus compact, campanulate, expanded, even, glutinous, shining when dry; flesh watery; stem solid, clavate, silky with lilac fibrils; gills adnate, rather thick, eroded at the margin, lilac, then cinnamon.

In pine woods.

Cortinarius (Myxaciun) elatior, *Fr.*

„ (Inoloma) pholideus, *Fr.* Cabalva.

Cortinarius (Inoloma) penicillatus. *Fr.*

Pileus rather fleshy, convex, umbonate, ferruginous brown, floccose with dense innate scales; stem stuffed, slender, equal, clad with adpressed ferruginous brown scales; gills adnate, seceding, rather crowded, dark brown.—*Fr. Hym.*, 265.

In pine woods. Cabalva.

Stem 2-3 inches long, 2-3 lines thick. Pileus 1 inch or more broad.

Cortinarius (Dermocybe) cinnamomeus, *Fr.* Cabalva.

Cortinarius (Dermocybe) militinus. *Fr.*

Pileus fleshy, thin, convex, cinnamon-bay, soon quite smooth, shining; stem hollow, tough, attenuated equally upwards, cinnamon, with red fibrils; base thickened, white, tomentose; gills adnate, narrow, plane, crowded, ferruginous.—*Fr. Hym.*, 369; *Grevillea t.* 110, *f.* 3.

In woods. Cabalva.

Cortinarius (Telamonia) hinnuleus, *Fr.* Cabalva.

„ „ ileopodius, *Fr.* Cabalva.

Cortinarius (Telamonia) paleaceus. *Fr.*

Pileus rather membranaceous, conical, then expanded, umbonate, silky with white scales, becoming brown; stem hollow, flexuous, girt with whitish scales like rings, pale brown; gills adnate, crowded, whitish, at length cinnamon.—*Fr. Hym.*, 386; *Grevillea t.* 113, *f.* 5, *t.* 114, *f.* 4. Cort. acutus, *Grevillea t.* 84, *f.* 1.

In beech woods. Cabalva.

Cortinarius (Telamonia) urbicus. *Fr.*

Pileus fleshy, convex plane, smooth, pale clay colour; stem solid, equal, becoming even, peronate, villous above the narrow white ring; gills emarginate, broad, watery ferruginous.—*Fr. Hym.* *Eur.*, 375; *Grevillea t.* 112, *f.* 1.

In grassy places. Cabalva.

Cortinarius (Telemonia) scutulatus. *Fr.*

Pileus fleshy, thin, ovate, expanded, obtuse, purplish umber (brick-red), at first whitish, silky about the margin, at length broken up into scales; stem solid, rigid, elongated, somewhat bulbous, dark violet externally and internally, white veil peronate; gills adnate, rather distant, purple.—*Fr. Hym.*, 377; *Grevillea t.* 112, *f.* 2.

In moist woods. Foxley, Cabalva.

Cortinarius (Hydrocybe) decipiens, *Fr.* Cabalva.

„ „ leucopus, *Fr.* Cabalva.

„ „ obtusus, *Fr.* Cabalva.

Cortinarius (Hydrocybe) uraceus. *Fr.*

Pileus fleshy, campanulate, convex, rather swollen, even, smooth, umber (clay-coloured); stem somewhat hollow, soft, equal, firm, fibrillose, striate, brown, then blackish, naked and olive-coloured at

the apex; gills adnate, ventricose, rather distant, bay-brown.—*Fr. Hym.*, 393.

In pine woods. Dinmore.

Cortinarius (Hydrocybe) fasciatus. *Fr.*

Pileus membranaceous, conical, then expanded, smooth, brownish (pale brick-red, silky), umbo rather thick, acute, turning blackish; stem rather hollow, breaking in a fibrous manner, undulating, smooth, pallid brown; gills adnate, thin, rather distant, cinnamon.—*Fr. Hym.*, 399; *Grevillea t.* 114, *f.* 5.

In pine woods. Dinmore.

(Concluded in our next.)

ASCI IN A POLYPORUS.

The Rev. M. J. Berkeley explained at the Conversazione of the Woolhope Club, at Hereford, the circumstances under which he found the pores of a *Polyporus* fringed at the margin, with asci containing spores. The specimens had been forwarded also to Mr. C. E. Broome, and he confirmed the observation in all essential particulars. The asci were perfectly naked, and there is not the slightest reason for the assumption that they bore any relationship to *Hypomyces*, or even that they were parasitic in any other manner. There was every appearance of their being a development, of an abnormal character, of the *Polyporus* itself. The explanation was offered in the hope of inducing further research in the same direction, so as to obtain some clue to the cause of a phenomenon so unusual and unexpected. See also *Gardener's Chronicle*, for Nov. 16th, 1879.

BRITISH HEPATICÆ.

In order to prevent disappointment, we are requested to intimate that the small work, "British Hepaticæ," by M. C. Cooke, has been advanced in price, and is eightpence—not fourpence, as formerly. It is published by David Bogue, No. 3, St. Martin's Place, Charing Cross.

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Grevillea,

A QUARTERLY RECORD OF CRYPTOGAMIC BOTANY
AND ITS LITERATURE.

RELIQUÆ LIBERTIANÆ.

By THE EDITOR.

The following is an enumeration, with descriptions, of fungi collected and characterized by Madame Libert, now in the Herbarium of the Botanic Gardens at Brussels.

Thelephora ozonoides. *Lib. in Herb.*

On bark of *Fagus*.

This is evidently a *Corticium* allied to *C. byssoideum* Fr., if not the same, but our specimens are without a perfect hymenium.

Corticium typhæ. *Fekl. Hydnum scirpinum, Lib. in Herb.*

On leaves of *Scirpus sylvaticus*.

There are no spines, the hymenium being perfectly smooth and even in our specimens, and hence it is not a *Hydnum*, but exactly the *Corticium* of Fockel.

Cyphella Libertiana. *Cke. Peziza sp. nov. Lib. in Herb.*

Gregaria, punctiformis, sessilis, alba, villosa, demum applanata margine elevato. Tomentum tenue.

On *Cornus mascula*. Certainly not *Cyphella villosa* P.

Pistillaria ramealis. *Lib. in Herb.*

Carnosa, pusilla, polymorpha, plerumque ramosa, pubescens, alba, e tuberculo sphaeriæforme nigro erumpens, ramis subfastigiatis obtusis. Sporis minutissimis, oblongis.

On bark of *Syringa* and *Rubus Idæus*.

Typhula hirsuta. *Lib. in Herb. (Pistillaria maculicola. Fekl.?)*

"Tenuis, simplex, alba; stipite elongato, hirsuto, cavo; clavula oblonga, subobtusula, glabra."

On fallen leaves of *Pyrus malus*.

Tremella culmorum. *Cke. (Dacrymyces albus, Lib. in Herb.)*

Incrustans, "expansa, tenax, plicato-undulata, alba; floccis assurgentibus, ramosissimis." Basidiis globosis, turbinatisque. Sporis—n. v.?

On culms of grasses. Summer.

Clearly a *Tremella*, and not a *Dacrymyces* as indicated by M. Libert. Distinct from *Sebacina incrustans*. Tul. although it might consistently be referred to that genus.

Tremella crypta. *Lib. in Herb.*

"Orbicularis, parva, compacta, plicata, rufo-fusca; plicis sublobatis."

On bark.

Very firm and devoid of structure. No definite hymenium seen. Apparently not a true *Tremella*.

Nematelia virescens. *Corda. Tremella genistæ, Lib. in Herb.*

On *Genista scoparia*.

Dacrymyces cerasi. *Lib. in Herb.*

On branches of *Cerasus*.

This is altogether a spurious species. The greater portion consists of cherry gum, which exudes through fissures in the bark. A few threads of mycelium and ordinary mould are enclosed in the gum whilst exuding. In some instances there are small granular bodies still adhering to the bark, but covered by the gum, which are probably small *Dacrymyces fragiformis* Nees. It is the presence of these occasional, and altogether foreign bodies, that has led to an erroneous judgment.

Leptostroma Caprea. *Lib. in Herb.*

"Sparsum, rotundum, vel ovatum, nigrum, nitidum, pulpa sporulosa alba, sporis ovoideis."

On twigs of *Salix caprea*.

Leptostroma Scorodonie. *Lib. in Herb.*

Subrotundum, inæquale, sub-confluens, tenue, læve, nigrum, totum secedens, macula nigra; sporis minutissimis, globosis, hyalinis.

On *Teucrium scorodonia*.

Leptostroma? Poæ. *Lib. in Herb.*

"Simplex, rotundum, læve, planissimum, nigrum, substantia ceracea, fusca, totum secedens. Asci obovatis minutis, fixis, sporidiis globosis, hyalinis."

On *Poa sudetica*.

This is certainly not a *Leptostroma*. There are no asci, but stipitate globose spores.

Leptothyrium Coryli. *Lib. in Herb.*

"Maculis magnis, orbiculatis, fuscis; peritheciis hypogenis, sparsis, minimis, planiusculis, rugosis, nigris, basi circumscissis; pulpa grisea, sporis ovatis, binucleatis, pellucidis."

On leaves of *Corylus* (not examined), most probably the spermogonia of *Gnomonia coryli*.

Septoria pyri. (*Lib.*) *Ascochyta pyri. Lib. in Herb.*

Epiphylla; maculis irregularibus, fusco-dealbatis; peritheciis atris, poro apertis, cirrhis albis, sporis linearibus, curvatis 10-14 nucleatis, pellucidis.

On leaves of *Pyrus sylvestris* (not examined, possibly *S. pyricola* Desm.).

Polystigma luteum. *Lib. in Herb.*

On living leaves of *Pyrus malus* (not examined, but apparently only the spermogonia of *Ræstelia*).

Zythia peltigeræ. *Lib. in Herb.*

Gregaria, mollis, hypophylla, peritheciis globosis, albis; ostiolo fusco aperto, gelatina sporulosa candida; sporis minutissimis, ovato-oblongis.

On *Peltigera polydactyla*.

It is possible that this may have some relationship to the *Nectria* found on the same plant.

Sphæropsis acuarium. *Cke. Sphæria? Lib. in Herb.*

Erumpens, subglobosa, atra, ostiolo perforato, nucleo albo fluxili. Sporis cylindricis, utrinque obtusis, hyalinis (0.015×0.004 mm.)

On fir leaves.

Hendersonia neglecta. *Westdp. Sporocadus arundinis; Lib. in Herb.*

On culms of *Phragmitis*.

Excipula caricum. *Lib. in Herb. Sub. Vermicularia.*

"Sparsa, innata, atra; peritheciis sphaericis, pilis longissimis tectis, pezizoideo-apertis; sporis fusiformibus, rectis, utrinque attenuatis."

On leaves of *Carices*.

Much smaller than *Dinemasporium graminum*, and the spores do not appear to be aristate. The distinctions between the genera *Excipula* and *Dinemasporium* appear to be too subtle for practical use.

Melanconium secalis. *Lib. in Herb.*

Peritheciis minimis, globosis, nigris, primo tectis, demum fissuratis, sporidiis ovalibus, atris, simplicibus, cirrhatim erumpentibus.

On culms of *Secale cereale*.

SCHIZOTHYRIUM. *Lib.*

Perithecium membranaceum, primo clausum, dein in lacinias a centro versus ambitum dehiscens, a nucleo discretum. Nucleus ceraceus, coloratus. Sporæ septatæ in floccos dichotomos concatenatæ, dein secedentes. Asci nulli.

Schizothyrium quercinum. *Lib.*

Hypophyllum, innatum, hemisphericum, nigrum, in lacinias 4-6 dehiscens; nucleo luteo, siccitate rubro, sporis cylindricis, utrinque obtusis, hyalinis.

On fallen oak leaves. Summer.

When fully mature and expanded resembling a *Stictis*.

Trichoderma lateritio-roseum. *Lib. in Herb.*

Hemispherico-pulvinatum, confluent, lateritio-roseum, pallescens; sporis pellucidis, minimis, ovalibus. nec Periola. *Fr.*

On rotten potato tubers.

Fusarium violaceum. *Fckl. Selenosporium cæruleum; Lib. in Herb.*

On potato tubers.

Fusarium Brassicæ. *Lib. sub. Selenosporium Brassicæ. Lib. in Herb. Fusarium rhizophilum. Cke. in Herb.*

"Effusum, aurantiacum, basidiis minutis; sporis fusiformibus; curvatis, utrinque acuminatis, 3-7 septatis."

On cabbage stems.

Psilonia rubella. *Lib. in Herb.*

Superficialis, oblonga, confluens, roseo-coccinea, villo in pelliculam albam contexto. Sporibus oblongatis.

On leaves of *Carex*, *Scirpus sylvaticus* and on *Juncus conglomeratus*.

Polyscytalum sericeum. (*Rabdosporium griseum*; *Lib. in Herb.*)

On oak leaves.

Fusidium flavo-virens. *Lk.*

On oak leaves.

Dicoccum roseum. *Lib. in Herb.*

Acervuli minuti sub-rotundi, rosei; sporibus elongatis, didymis, seu uniseptatis.

On stems of herbs.

Macrosporium Cheiranthi. *Lib.* (sub *Helminthosporium Cheiranthi.*)

On leaves and pods of *Cheiranthus*.

Scarcely distinct from *Macrosporium commune*. *Rabh.*

Ombrophila Clavus. (*A. & S.*) forma (*Leotia aquatica. Lib. in Herb.*)

A form with a long ventricose, farinose stem, but apparently only a variety.

On submerged wood.

Peziza (Dasyscypha) Secalis. *Lib. in Herb.*

Minuta, sparsa, sessilis, globosa, strigoso-tomentosa, sulphureo-fuscescens, disco roseo. Sporibus linearibus, minutis.

On culms of *Secale cereale*.

Similar in many features to *Peziza mutabilis*, B. & Br.

Peziza (Dasyscypha) mollissima. *Lasch.* (*Peziza orina. Lib. in Herb.*)

On stems of *Valeriana officinalis*.

Leciographa (?) circinans. *Phillips.* (*Peziza circinans. Lib. in Herb.*)

On *Peltigera canina*.

This is a Lichen.

Peziza (Mollisia) Senecionis. *C. and Ph.* (*Peziza sp. nov. Lib. in Herb.*)

On *Senecio sarracenii*.

"*Peziza atratae* proxima a quo præsertim differt margine concolore, et colore fusco," *Nees in Litt.* 10 Feb., 1825.

Peziza (Hymenoscypha) amenti. *Pers.* (*Peziza amenticola.*

Lib. in Herb.

On catkins of *Salix*.

Peziza (Hymenoscypha) spinosæ. *Lib. in Herb.*

Sub *Peziza Pruni-spinosæ*.

Fusca, firmula, in subiculo irregulari nigro innata; cupula orbicularis planiuscula, margine prominente, stipite elongato, ascis tenuissimis, cylindricis. Sporidiis ellipticis, hyalinis $\cdot 005 \times \cdot 002$ mm.

On dead leaves of *Prunus spinosa*.

Helotium epiphyllum. *P.* (*Peziza nov. sp. Lib. in Herb.*)

On leaves of *Fagus*, &c.

Vibrissæa pezizoides. *Lib. in Herb.*

Carnosa, subturbinata, extus umbrina; hymenio dilute flavo, ex paraphysibus longissimis erumpentibus velutino. Ascis tubulosis; sporidiis oblongis hyalinis.

On branches and wood in wet places.

Ascobolus (Ascophanus) carneus. P. (*Peziza chartarum*.
Lib. in Herb).

On paper.

Cenangium Sarothamni. Fekl. (*Cenangium Genistæ*, Lib. in Herb)
Sporidia allantoid; $\cdot 009 \times \cdot 002$ mm.
On *Genista scoparia*.

Cenangium vernicosum. Fekl. (*Tympanis Padi*, Lib. in Herb).
On branches of *Prunus padus*.

Tympanis populi. Lib. in Herb.

Minute spermatia only.

On branches of *Populus fastigiata*.

It is impossible to determine this species satisfactorily from the material before us. This applies also to the next species.

Tympanis pini. Lib. in Herb.

Only small elliptical stylospores about $\cdot 007 \times \cdot 003$ mm.

On *Pinus picea*.

Eustegia arundinacea. Fr. (*Peziza phalaridis* Lib. in Herb.)
On culms of *Phalaris arundinacea*.

Peziza (Mollisia) perpusilla. (Lib.) *Stictis perpusilla*, Lib. in Herb.

Innato-erumpens, minutissima, hemisphærica, nigra, ore contracto punctiforme, margine albo, integro. Ascis subclavatis. sporidiis allantoideis, $\cdot 014 \times \cdot 003$ m.m.

On *Juncus conglomeratus*.

This is rather an erumpent *Peziza* than a *Stictis*, allied to *P. caricina*.

Phacidium Trifolii. Lib. in Herb.

This is not *Phacidium Trifolii*, but a smaller species, it may be of *Phacidium Medicaginis*; but as there is no fruit this cannot be affirmed.

On leaves of *Trifolium medium*.

Phacidium Rubi. (*Phacidium* sp. nov. Lib. in Herb.)

On *Rubus*.

Hysterium (Lophodermium) ciliatum. Lib. in Herb.

Innato-superficiale, aggregatum, rotundatum, vel ellipticum, nigrum, disco lato, fuligineo, apertum, margine ciliis candidas ornato. Ascis clavatis. Sporidiis filiformibus.

On stems of *Epilobium angustifolium*.

Sporomega cladophila (?) (*Hysterium Vaccinii*, Lib.)

On *Vaccinium myrtillus*.

The specimens are sterile.

Hysterium conigenum. Fr. ?

On strobiles of *Pinus*.

The specimens are sterile.

Phacidium pinastri. Lib. in Herb.

On leaves of *Pinus picea*.

The specimens are sterile.

Nectria lecanodes. Ces. (*Sphæria peltigeræcola*, Lib. in Herb.)
On *Peltigera*.

We are inclined to believe that *Sphæria sanguineo-punicea*, Lib.

in Herb., is an undeveloped condition of the same species. Our specimens are imperfect and sterile.

Gibbera pulicaris. Fr. (*Sphæria cærulea*, Lib. in Herb.)

On stems of *Brassicæ oleracea*.

Our specimens are sterile.

Gibbera pulicaris. (*Sphæria populicola*, Lib. in Herb.)

On branches of Poplar.

Also the same species, mostly stylosporous, but with a few asci, which are scarce mature.

Valsa leucostoma. P. var. **Juniperina** *Sphæria* sp. nov. Lib. in Herb.

Hardly distinct from *V. leucostoma*. Disc white.

On branches of *Juniperus*.

Melanconis modonia. Tul. (stylospores). *Stegonosporium Castaneæ*, Lib. in Herb.

On bark of *Castanea*. Autumn.

Melanconis macrospora. Tul. (stylospores). *Coryneum macrospora*, Berk. *Scolicosporium Fagi*, Lib. in Herb.

On bark of *Fagus*.

Melanconis chrysostroma. Tul. *Didymosporium deplanatum*, Lib. in Herb.

On branches of *Carpinus*.

The yellow stroma is not recognizable in the dried specimens, but habit and fructification are identical. Madame Libert apparently overlooked the asci, which are nevertheless present.

Massaria loricata. Tul. (stylospores). *Melanconium Fagi*, Lib. in Herb.

On bark of *Fagus*.

Diaporthe occulta. Nitschke. *Sphæria strobilicola*, Lib. in Herb.

On scales of cones of *Pinus abies*.

Melogramma homaleum. Fr. proxima. *Sphæria* sp. nov., Lib. in Herb. Sporidiis elliptico-elongatis, triseptatis, fuscis.

On branches of *Acer pseudoplatanus*.

Dothiora sphæroides. Fr. *Dothichiza sphæroides*, Lib. in Herb.

On bark. With perfect asci, and mature sporidia.

Dothiora pyrenophora. Fr. *Dothichiza Sorbi*, Lib. in Herb.

On *Sorbus aucuparia*.

These specimens will prove that Fuckel was correct in removing *Dothiora* to Ascomycetes.

Dothiora pinastri. (Lib.). *Dothichiza pinastri*, Lib. in Herb.

On bark of firs.

Lasiosphæria ovina. Pers. *Sphæria species novæ*, Lib. in Herb.

On *Phalaris arundinacea*.

Lasiosphæria macrotricha. (B. & Br.). *Sphæria* sp.

On *Rubus Idæus*.

Also on fir leaves.

The latter greatly resembles in habit and external features a species from North America, of which the following is the diagnosis.

Lasiosphæria acicola. *Cooke.*

Peritheciis subglobosis, papillatis, superne glabris, atro-brunneis, in bysso effuso, intricato nidulantibus. Ascis cylindraceis. Sporidiis uniserialibus ellipticis, utrinque subattenuatis, uniseptatis, leniter constrictis, brunneis (0.028×0.01 mm.).

On pine leaves. Rocky Mountains. (Dr. Lyall in Herb., Kew.).

The dense brown byssus unites the mass of leaves into a compact crust, in which the perithecia are semi-immersed. The lower portion of the perithecia alone are woolly, the upper and exposed portion being quite smooth.

Sphæria vacciniicola. *Lib. in Herb.*

Sparsa, peritheciis immersis, globosis, nigris, ostiolo minutissimo areola albicante cincto, nucleo gelatinoso livido. Ascis linearibus. Sporidiis ellipticis, subnaviculoides hyalinis.

On dead leaves of *Vaccinium Vitis Idæa*.

This is the *Physalospora claraebonæ*, "Speg. Dec. Ital.," No. 88.

Venturia ilicicola. *Cke. in Hdbk.*

Sphæria conoplea, *Lib. in Herb.* var. *β. ilicinola*, *Lib.*

On Holly leaves.

Venturia conoplea. *Lib. in Herb.* Sub *Sphæria*.

"Peritheciis minimis, globosis, superficialibus, arcte collabentibus, atris; pilis erecto-divergentibus obsitis. Ascis brevibus, subfusiformibus." Sporidiis arcte ellipticis, hyalinis, uniseptatis.

On pine leaves.

Hairs of perithecia shorter than in *V. ilicicola*. Perithecia subgregarious (0.13 mm.). Sporidia 0.006×0.002 mm.

Perisporium Rubi. *Lib. in Herb.*

Superficiale, innatum, gregarium, globosum, nitidum, atrum, poro pertusum. Sporidiis concatenatis cylindricis.

On branches of *Rubus*.

No fruit found by us, hence it is doubtful whether it is not rather a *Leptostroma*, or some allied genus.

Eurotium album. *Lib. in Herb.*

Peridiis membranaceis, albis, irregulariter ruptis; floccis tenerimis ramosis, demum evanescentibus albis. Sporis globosis, concoloribus primum concatenatis, dein liberis.

On dead leaves, &c.

Certainly not an *Eurotium*.

Sclerotium Convallariæ. *Lib.*

Sclerotium inconspicuum. *Lib.*

Xylostroma, *sp. Lib.*

} Wholly incomplete fungi.

NOTE.—The above was already in type when we received 'Revue Mycologique,' in which, under the same title, this collection is enumerated.

THE SUB-GENUS CONIOPHORA.

By M. C. COOKE.

In a former communication some observations were made on the advantages which would accrue from a revision of the large genus *Corticium*. Many species were then removed to the new genus *Peniophora*. Further study of the species referred to this genus, especially by the aid of the microscope, has led to a scheme for rearrangement of the sub-genus *Coniophora*, Fr. ("Hym. Eur.," p. 657).

This sub-genus was certainly admitted by Fries, from Persoon, for the reception of species having a pulverulent hymenium, of which his *Thelephora puteana* was to be the type. Evidently he was under the impression that the *Coniophora membranacea*, DC., was a sterile condition of *Merulius lacrymans*, to which also the figure of Sowerby (t. 214) was referable. Having received from Simla (India) a specimen, taken from the wall of the gaol, which reminded us so strongly of Sowerby's figure, and which also might have passed for a sterile condition of a *Merulius*, we examined it and found the coloured elliptical spores most profuse. These agreed again with a specimen under the name of *Coniophora membranacea*, DC., in "Herb. Limminghe." From a careful perusal we feel satisfied that this is Persoon's plant, and, certainly, that it is the *Auricularia membranacea*, Sowerby, and is a most characteristic species.

Accepting, then, *Thelephora puteana*, Fr., and *Coniophora membranacea*, Pers., as typical of the sub-genus *Coniophora*, with a pulverulent hymenium, caused by the profusion of large coloured spores which are produced, we have appended a list of such species as we have been able to examine, forming a most natural division, and one which will greatly aid in the determination of species, so closely, almost *too* closely in some instances, allied to each other.

Some of the species included by Fries under this division in "Hym. Eur.," we have never seen, others, which we have examined, do not fulfil the conditions indicated.

Sub. genus. **CONIOPHORA.** Pers.

Hymenium pulverulent; spores large, profuse, coloured.

1. **Corticium (Coniophora) puteanum.** Schum. Fr. Hym. Eur., 657.
On the faith of specimens from Fries.

On wood, &c.

Europe.

Professor Saccardo writes of a form with much smaller spores, but the specimen in my copy of *Fungi veneti*, No. 799, has no spores.

2. **Corticium (Coniophora) brunneolum.** B. & C. North American
Fungi, No. 285.

From specimen in the Berkeley Herbarium.

On wood.

U. States.

3. **Corticium (Coniophora) Ellisi.** (*B. & Cke.*) *Hymenochaete Ellisi*.
Berk. & Cke. Berk in North American Fungi, No. 1005.
Basidia very distinct. Certainly not a species of *Hymenochaete*. Spores narrowly elliptical, brown.
On wood. U. States.
4. **Corticium (Coniophora) leucothrix.** *B. & C.* North American Fungi, No. 284.
From an authentic specimen.
On pine wood. U. States.
5. **Corticium (Coniophora) aridum.** *Fr. Hym. Eur.*, p. 659.
From an authentic specimen from Fries.
On pine wood. Europe.
6. **Corticium (Coniophora) fuscum.** *Fr. Hym. Eur.*, p. 651.
This is included on the faith of a very uncertain specimen.
On *Salix*. Europe.
7. **Corticium (Coniophora) luteo-cinctum.** *B. Thelephora luteo-cincta.* Berk. Linn. Journ., xlii., p. 168.
From specimen in Herb. Berkeley.
On the ground. Australia.
8. **Corticium (Coniophora) submembranaceum.** *B. & Br. Thelephora submembranacea,* Berk. & Br. Fungi, Ceylon, No. 584.
From specimen in Herb. Berkeley.
On bark (?). Ceylon.
9. **Corticium (Coniophora) viride.** *Berk. Thelephora viridis.* Berk.
Spores nearly globose, smooth, brown.
Specimen in Berkeley Herbarium.
On branches. New Zealand.
10. **Corticium (Coniophora) pulverulentum.** *Lev. Thelephora pulverulenta.* Lev. Ann. Sci. Nat., 1846, v. 149.
Specimen in Berkeley Herbarium.
On trunks. Natal.
11. **Corticium (Coniophora) olivaceum.** *Fr. Hym. Eur.*, p. 660.
On the faith of original specimen from Fries.
On pine wood. Europe.
12. **Corticium (Coniophora) membranaceum.** *Pers. Myc. Eur.*, I., 153. DC. *Fl. Fr.*, 634. *Auricularia pulverulenta.* Sow., t. 214.
From specimen in Herb. Linninghe.
On walls, paper, &c. Europe, India.
13. **Corticium (Coniophora) fusisporum.** *Cke. & Ellis* in Grevillea.
A most distinct species, with elongated fusiform spores.
Overrunning wood, &c. U. States.

Subsequently we hope to furnish a revised catalogue of the species of *Hymenochaete*, and also of the resupinate species of genuine *Thelephora*. These have all been very much mixed up, and are confused, through inattention to their microscopical characters.

DIATOMACEÆ OF KERGUELEN'S LAND.

Algæ aquæ dulcis Insulæ Kerguelensis, auctore P. F. Reinsch, cum notulis de distributione geographica a G. Dickie, adjectis. ("Trans. Roy. Soc.," vol. 168 pp. 66-69).

Diatomaceæ.

Stauroneis gæppertiana ?=*S. dilatata*.

„ *anceps*.

„ *Phænicenteron*.

Achnanthes exilis.

Surirella diaphana ?=*Surirella splendida*.

Campylodiscus.—Species nova (Reinsch., in "Journ. Linn. Soc.," xv., 205), magnus elliptico-ovalis, utroque polo rotundato-obtusos, costis marginalibus radialibus, crassus, crassis usque ad tertiam partem latitudinis superficies se pertinentibus in quoque latere 22is-24is, areolas 21as-22as, rectangulare includentibus, area media lævi; frustulæ visæ simpliciter spiraliter curvatæ, areolis 21is-22is, rectangularibus instructæ. Diam. longit. .132mm.; diam. transvers., .0666mm. Costæ, m. .02mm. tres.

In speciminibus singulus, inter *Schizosiphontes kerguelensis* cæspites.

A. Campylodiscis frustulis oblongis. *Campylod. Surirella*, Eh., mihi tantum, ex diagnosi, nota proxima species videtur. *Gomphonema Brebissonii*.

Amphiprora.—Spec. nov. (Reinsch., in "Journ. Linn. Soc." xv., 205), parva rectangularis, subtilissime, striata, medio parum, constricta, utroque, polo late, truncato rotundato, lineis intermediis, duabus in medio cellulæ, æqualter, extrorsum curvatus, aream mediam, cruciformem, lævem circumcingitibus, nodulo singulo et in quoque, latere cellulæ in decussi linearum, incluso et in summo, utriusque lineæ. Longit., .0333mm.

Amp. Porkornyana, Grunow.

Navicula elliptica, Kutz.; var. *cocconeoides*.

„ *dicephala*, Ehr.

„ *minutissima*, Grunow.—Non sine dubio *N. kerguelensis* ad hanc speciem est positus.

Navicula.—spec. Cellulis lanceolatis, apicibus capituliformibus porrectis, nodulo centrale et linea media indistincta, marginibus distincte striatis, striis ad mediam non pertinentibus. Longit., .0278mm.; latit., .0056mm.

Amphora gracilis, Ehr.

Pinnularia viridula, W. Sm.

„ *viridis*, Ehr.

Pinnulariæ.—species. Cellulis ovato-ellipticis, polis rotundatis, nodulo centrali, firmo, striis, transversalibus, distinctis, lineam

mediam attingentibus. Longit., ·0168mm.-·196mm.; latit., ·0084mm.

Pinnulariæ.—species. Cellulis, late ovato-ellipticis, polis subito, angustatis, apicibus, rotundatis, nodulo centrali firmo, striis transversalibus distinctis, lineam mediam attingentibus. Longit., ·0224mm.; longit., ·0111.

Synedra Vaucheriæ, Kützing.

Eunotia pectinalis, Dillwyn.

Denticula thermalis, Kütz, var. *minor*.—Longit., ·0168 mm.; latit., ·0056 mm.

Cymbella gastroides, Ehr.

The above list of Diatoms is extracted from T. F. Reinsch's Catalogue of Freshwater Algæ, collected by the Rev. A. E. Eaton in Kerguelen's Island. It is much to be regretted that this portion had not been more carefully revised. There are more errors in it than would be found in double the number of pages in any cheap scientific periodical, as the following *errata* will prove :—

Aclianthes instead of Achnanthes.

Larilella and Lurilella instead of Surirella.

Amphiprora Pockorngana instead of Porkornyana.

The omission of specific names when new species are described is a source of much inconvenience to other observers, particularly in labelling slides, and is a worse practice than using the names of individuals for specific distinctions.

F. KITTON, Hon., F.R.M.S.

PREPARATIONS OF ALGÆ.

A series of microscopical slides, illustrating the principal genera of British Freshwater Algæ, has been prepared by Messrs. Joshua and Holmes, of which we give a list. Such a collection must prove most valuable to a student, and far superior to the most elaborate figures, in giving accurate notions of the characteristics of genera and families.

1. Licmophora splendida, Grev.
2. Isthmia nervosa, Ktz.
3. Aphanocapsa virescens, Rab.
4. Oscillaria limosa, Ag.
5. „ muscorum, Ag.
6. Nostoc commune, Vauch.
7. „ granulare, Ktz.
8. „ rupestre, Ktz.
9. Cylindrospermum macrospermum, Ktz.

10. *Gloietrichia gigantea*, *Rab.*
11. *Scytonema myochrous*, *Ag.*
12. *Sirosiphon Bonteillei*, *Breb. & Desm.*
13. *Glæocystis vesiculosa*, *Naeg.*
14. *Palmella mucosa*, *Ktz.*
15. „ *botryoides*, *Ktz.*
16. *Apiocystis Brauniana*, *Naeg.*
17. *Volvox globator*, *L.*
18. *Protococcus viridis*, *Ag.*
19. *Hydrodictyon utriculatum*, *Roth.*
20. *Penium oblongum*, *De Bary.*
21. *Closterium acerosum*, *Ralfs.*
22. *Pleurotœnium baculum*, *Breb.*
23. *Cosmarium cucumis*, *Roth.*
24. *Euastrum oblongum*, *Ralfs.*
25. *Micrasterias rotata*, *Ralfs.*
26. *Staurostrum cuspidatum*, *Ralfs.*
27. *Zygnema nitidum*, *Hass.*
28. *Zygogonium ericetorum*, *Ktz.*
29. *Mesocarpus ovalis*, *Hass.*
30. *Pleurocarpus mirabilis*, *A. Braun.*
31. *Hydrogastrum granulatum*, *L.*
32. *Vaucheria terrestris*, *Hass.*
33. *Prasiola crispa*, *Ktz.*
34. *Sphæroplea annulina*, *Ag.*
35. *Cladophora glomerata*, *L.*
36. *Bulbochæte setigera* (*Roth*), *Ag.*
37. *Cedogonium Boscii*, *Breb.*
38. *Ulothrix tenerrima*, *Ktz.*
39. *Schizogonium murale*, *Ktz.*
40. *Chroolepus aureus* (*L.*), *Ktz.*
41. *Chætophora endivæfolia* (*Roth*), *Ag.*
42. „ *radians*, *Ktz.*
43. *Coleochæte scutata*, *Breb.*
44. *Draparnaldia glomerata* (*Vauch*), *Ag.*
45. *Porphyridium cruentum*, *Naeg.*
46. *Chantransia Hermannii* (*Roth*), *Desm.*
47. *Batrachospermum moniliforme*, *Hass.*
48. *Lemania torulosa* (*Roth*), *Ag.*

For information concerning them, apply to W. Joshua, Esq., F.L.S., Cirencester.

Apropos of this subject, the Editor of this Journal would be thankful for lists of British Freshwater Algæ (exclusive of Diatomaceæ) in order to their incorporation in a work now in preparation; in which geographical distribution is desirable to be recorded.

FUNGI OF INDIA.

By M. C. COOKE.

The following is an enumeration of Fungi from British India, of which the majority were communicated by Colonel Julian Hobson :—

Corticium (Coniophora) membranaceum. *D.C.*

Spores brown, large, profuse.

On walls of gaol, Simla (Prof. Balfour.)

Leptostroma leguminum. *Cke.*

Punctiformis, sparsa, sub-epidermide nidulans, brunnea, superne porosa. Sporis ovoideis, hyalinis ($\cdot 005 \times \cdot 003$ mm.).

On legumes of *Clitorea*. Madras.

Phoma Rheea. *Cke.*

Sparsa, parvula. Peritheciis globoso-compressis, tectis; sporis ellipsoideis, utrinque nucleatis ($\cdot 01 \times \cdot 003$ mm.).

On stems of *Bæhmeria nivea*. Assam.

Sphæropsis absus. *Cke.*

Sparsum, erumpens. Peritheciis sub-globosis, atris, demum apice prominulis. Sporis late ellipticis, demum brunneis ($\cdot 02 \times \cdot 012$ mm.).

On twigs of *Cassia absus*. Madras.

Sphæropsis cassiæcarpum. *Cke.*

Punctiforme, sparsum. Peritheciis depressis, atris, poro pertusis. Sporis cylindricis, utrinque rotundatis, hyalinis ($\cdot 025\text{--}\cdot 03 \times \cdot 006$ mm.).

On legumes of *Cassia absus* and *Clitorea*. Madras.

Sphæropsis Clitoreaëcarpum. *Cke.*

Sparsum, punctiforme. Peritheciis atris, subglobosis, primo tectis, demum erumpentibus. Sporis late ellipticis, hyalinis ($\cdot 02\text{--}\cdot 025 \times \cdot 012\text{--}\cdot 014$ mm.).

On legumes of *Clitorea*. Madras (Dr. Bidie).

Sphæropsis ? musarum. *Cke.*

Peritheciis semi-immersis, atris, nitidis, subconicis, in maculis parvulis congestis. Sporis subglobosis, vel ovatis, vel ellipticis, hyalinis ($\cdot 012\text{--}\cdot 022 \times \cdot 01\text{--}\cdot 014$ mm.).

On *Musa paradisiaca*. Belgaum (Col. Jul. Hobson, 230).

The mode of development of the spores in the perithecia is uncertain, no pedicels could be traced, and the spores have the appearance of being differentiated by division.

Diplodia hypoxylloidea. *Cke.*

Cæspitosa, erumpens. Peritheciis atris, papillatis, in pulvinulis convexis congestis, stromate diatrypoides. Sporis ellipticis, atro-brunneis, uniseptatis, leniter constrictis ($\cdot 018\text{--}\cdot 02 \times \cdot 008$ mm.).

On bark of root of *Moringa*. Bengal.

Diplodia Rheeae. Cke.

Sparsa, erumpens. Peritheciis atris, globosis, subpapillatis. Sporibus ellipticis, fuliginosis, demum uniseptatis (0.02×0.008 mm.).

On stems of *Bahmeria nivea*. Assam.

Septoria alliacea. Cke.

Sparsa, punctiformis. Peritheciis immersis, tectis, vix distinctis. Sporibus filiformibus, flexuosis (0.05 - 0.06 mm. long).

On leaves of some alliaceous plant. Belgaum (Col. Jul. Hobson, 281).

Septoria arcuata. Cke.

Epiphylla. Maculis albidis, orbicularibus, purpureo-cinctis. Peritheciis minimis, immersis, ostiolo papillato, exserto. Sporibus linearibus, arcuato-curvatis, multi-nucleatis (0.04 - 0.05 mm. long).

On leaves of *Ficus*. Belgaum (Col. Jul. Hobson, 18).

Phyllosticta cocos. Cke.

Maculis pallidis, irregularibus, subellipticis, brunneo-cinctis. Peritheciis punctiformibus, atris. Sporibus arcte ellipticis (0.008×0.003 mm.).

On leaves of *Cocos nucifera*. Belgaum (Col. Jul. Hobson, 240).

Uredo Balsaminæ. Cke.

Hypophyllis. Sporibus sparsis, oblongis, aurantiacis, epidermide hyalino cinctis. Sporibus ellipticis, asperulis (0.025 - 0.03×0.015 mm.) aureis.

On *Impatiens rosmarini folia*. Ceylon (D. Morris).

It has all the habit and appearance of a *Coleosporium*, but whether so or not could not be determined from the specimen, as all the spores had become free.

Triphragmium Acaciæ. Cke.

Amphigenum. Soris brunneis, mediis, sparsis. Pseudo-sporibus ovatis, tricellulosis (0.05 - 0.06×0.035 - 0.04 mm.), atrobrunneis. Episporio hyalino-spiculatis. Aculeis supra obtusis. Stipite hyalino, infra attenuato. Protosporibus subglobosis fuscis (0.023 - 0.028×0.02 mm.), laevibus.

On leaves of *Acacia*. Belgaum (Col. Jul. Hobson, 17-18).

Trichobasis sp., on leaves of unknown tree. No. 189. Belgaum.

Puccinia sp., on leaves of unknown tree. No. 323. Belgaum.

Melampsora sp., on unknown plant. No. 302. Belgaum.

These cannot be determined more definitely. It is useless to give names to species of *Puccinia* or *Trichobasis* of which the host is unknown.

There is a very curious epiphyte on leaves, No. 215 Belgaum, which seems to form the type of a new genus, but it could scarcely be described without some knowledge of its host.

Oidium carneum. Cke.

Effusum, carneum, farinaceum. Hyphis repentibus, tenuibus, septatis, ramosis; ramulis assurgentibus, sporibus ellipticis, truncatis, concatenatis (0.02×0.015 mm.), carneis gerentibus, episporio granulato.

On leaves of *Malvaceæ*, &c. Belgaum (Col. Jul. Hobson, 212-320).

***Sterigmatocystis ferruginea.* Cke.**

Effusa, lanosa, ferruginea. Hyphis erectis, hyalinis, septatis, supra globoso-capitatis. Sporibus globosis, ferrugineis, asperulis, ($\cdot 01$ mm. diam.).

On pupa of *Eria* silk moth. Cachar (F. Moore).

Each of the wedge-shaped processes which radiate from the globose head bears two or three elliptical cells, packed side by side, each surmounted by three or four papillæ, each of which bears a spore.

***Cercospora Caladii.* Ck.**

Maculis orbicularibus, fuscis. Hyphis paucis, rectis, simplicibus, in cæspitulis minimis collectis. Sporibus subcylindricis, supra attenuatis, hyalinis, 5-7 septatis ($\cdot 06$ - $\cdot 09 \times \cdot 003$ mm.).

On fading leaves of *Caladium*. Belgaum (Col. Julian Hobson).

The upper third part of the spore without septa.

***Cercospora annulata.* Cke.**

Amphigena. Maculis orbicularibus, pallidis, concentrico zonatis. Sporibus subcylindricis, tennibus, vix distincte septatis, sparsis, ($\cdot 06$ mm. long) hyphis repentibus.

On leaves of *Ficus hispida*. Calcutta (Dr. J. Scott).

Spores very diffluent, so that it is difficult even to determine the genus. It appears to be extremely common on leaves of *Ficus*, destroying the foliage.

***Cladosporium herbarum.* Link.**

On leaves and legumes of *Acacia*. Belgaum (Col. Jul. Hobson, 185-241).

***Cladosporium delicatulum.* Cke.**

On dead leaves. Belgaum (Col. Jul. Hobson, 23-239).

***Ailographium cæspitosum.* Cke.**

Maculæforme, epiphyllum. Peritheciis elongato-ellipticis, rectis, vel subcurvulis ($\cdot 4 \times \cdot 2$ mm.) atris, lævibus, in mycelio radiato, brunneo, gregariis; labiis rigentibus. Ascis clavatis, sporidiis arcuato ellipticis, uniseptatis, fuscis ($\cdot 015 \times \cdot 005$ mm.).

On coriaceous leaves. Belgaum (Col. Jul. Hobson, 307).

Forming little clusters seated on a brown radiating mycelium, after the manner of *Asterina*.

***Dothidea repens.* Corda.**

On leaves of *Ficus religiosa*. Belgaum (Col. Jul. Hobson, 228).

***Dothidea annulata.* Cke. pro. tem.**

A curious species, with the perithecia forming little rings, but entirely sterile.

On leaves of unknown tree, Belgaum, No. 274 (Col. Jul. Hobson).

***Asterina congesta.* Cke.**

Epiphylla. Peritheciis discoideis, atro-brunneis ($\cdot 1$ - $\cdot 15$ mm.), fissurato-dehiscentibus, densissime congestis. Mycelio tenui,

brunneo, sparso. Ascis ovatis. Sporidiis ellipticis, brunneis, medio hyalino-cinctis, demum uniseptatis ($\cdot 02 \times \cdot 01$ mm).

On leaves of *Santalum album*. Belgaum (Col. Jul. Hobson, 208).

There is also from Belgaum an immature *Asterina* on leaves of *Nerium*.

***Asterina carbonacea.* Cke.**

Maculæformis. Peritheciis appplanatis, discoideis, opacis, atris, gregariis ($\cdot 15$ mm. diam.) hyphis paucis, radiantibus. Sporidiis ellipticis, uniseptatis, medio constrictis, atro-brunneis ($\cdot 05$ - $\cdot 045 \times \cdot 02$ mm.).

On coriaceous leaves. Belgaum (Col. Jul. Hobson, 244).

The perithecia are much more carbonaceous than usual in this genus.

***Capnodium lanosum.* Cke.**

Late effusum, lanosum, atro-brunneum. Peritheciis simplicibus, vel ramosis, attenuatis, hinc illic cæspitoso-fasciculatis. Sporidiis ellipticis, uniseptatis, hyalinis ($\cdot 016$ - $\cdot 018$ and $\cdot 008$ mm.). Hyphis ramosis, densissime intertextis, moniliformibus.

On leaves of *Ficus*, Belgaum. (Col. Jul. Hobson, 235-317).

The lower cell of the sporidia usually the narrowest. Perithecia about $\cdot 3$ - $\cdot 35$ mm. long.

***Capnodium Eugeniæarum.* Cke.**

Effusum, fuliginoso-atrum, subpelliculosum. Peritheciis simplicibus, ventricosus, sub-rectis, in subiculo membranaceo hinc illic pelliculoso insidentibus. (Sporidiis ignotis.)

On leaves of *Jambosa vulgaris*. Belgaum (Col. Jul. Hobson, 201).

The perithecia do not exceed $\cdot 15$ mm. in length, often less, obovate when young.

The following species also from Belgaum, communicated by Col. Julian Hobson :—

Cyathus limbatus. Fr. No. 1.

Calocera viscosa. Fr. No. 2.

Xylaria scopiformis, Mont. Sterile. No. 3.

Peziza epispartica. B. & Br. No. 4.

Hirneola blepharistoma. B. & C. No. 5.

Xylaria aristata. Mont. No. 6.

Xylaria escharoidea. B. Without number.

Microthyrium microscopicum. Desm. No. 190.

Uromyces Amygdali. C. No. 193.

Puccinia purpurea. C. No. 222.

Trichobasis exasperata. C. No. 212, 277.

Graphiola phœnicis. Poit. No. 237, 298.

Meliola amphitricha. Fr. No. 255.

Meliola ziczac. B. & Br. No. 267, 268, 290.

Ravenelia aculeifera. B. No. 269.

Two or three *Agarics* also await further information.

NEW AND RARE BRITISH FUNGI.

By W. PHILLIPS, F.L.S., and CHARLES B. FLOWRIGHT.

WITH PLATE 130.

(Continued from Vol. vi., p. 29).

111. **Agaricus (Clitocybe) ditopus.** *Fr. Hymen., p. 104.*

Odour strong, pileus somewhat fleshy, convex, becoming plane, depressed, smooth, glabrous, hygrophanous; stem hollow, equal, nearly naked; gills adnate, crowded, thin, darkly ash-grey.

Having the stature of *A. metachrous*,* but with a strong odour of new meal.

On dead leaves. Tibberton Firs, Salop. Oct. Rev. W. Houghton.

112. **Agaricus (Pholiota) Ægerita.** *Fr. Hymeno., p. 219. Brigant. t. 32, 33, f. 1-4.*

Pileus fleshy, convex, then plane, rivulose, rugulose, fulvous, becoming pallid towards the margin; stem stuffed, equal, white, silky, fibrillose, ring high up and tumid; gills adnate, decurrent with a little tooth, pallid then brown.

Flesh white, odour pleasant.

On a dead elm tree. South Wootton. August, 1879.

113. **Agaricus (Hebeloma) petiginosus.** *Fr. Hymen., p. 243.*

Pileus somewhat fleshy, from conical-convex becoming expanded, dry, the disc gibbos, fuscous, with a hoary silkiness at the circumference; stem stuffed, firm, slender, powdery, brick-red; gills free, ventricose, from yellow becoming olive-brown.

Kings Lynn.

114. **Coprinus narcoticus.** *Fr. Hymen., p. 329.*

Fetid, pileus very slender, from clavate becoming expanded, albo-villose, with recurved floccose scales, then naked, striate, hyaline; stem fragile, white, woolly, becoming glabrous; gills, free, reaching the stem, white then black.

On a manure heap. Oct. Shrewsbury.

The odour of this species is similar to that of *Hygrophorous foetens*, Phil.

115. **Cortinarius (Myxacium) delibutus.** *Fr. Hymeno., p. 357.*

Pileus fleshy, thin, convexo-plane, smooth, obtuse; stem smooth, stuffed, elastic, slender, attenuated, whitish-glutinous; gills adnate, rather distant, serrated, from pallid blue becoming clay-red colour.

Stem 2-4 inches long and 1-4 lines thick, shining, becoming hollow at the apex.

Kings Lynn. Oct., 1879.

116. **Cortinarius (Telamonia) flexipes.** *Fr. Hymeno., p. 384*

Pileus rather fleshy, conical, then expanded, acutely umbonate, from violaceous becoming brownish cinnamon (clay-brown), hoary fibrillose; stem slender, stuffed, flexuous, sub-undulate, with fibril-

lose squamules, violet at the apex, veil white, sub-annulate; gills adnate, broad, somewhat distant, brown-violet, then cinnamon.

Forres. Rev. J. Keith.

- * **Lactarius mammosus.** *Fr. Hymeno., p. 434.*

Holme Lacy. 1879.

- * **Lactarius picinus.** *Fr. Hymeno., p. 435.*

117. **Lactarius lilacinus, Lasch.** *Fr. Hymeno., p. 435.*

Pileus fleshy, thin, convex, then depressed, papillate, dry, floccose, granulose, zoneless, lilac-rosy; stem stuffed, then hollow, mealy-white, pallid; gills adnate, rather distant, pale-flesh colour; milk acrid, white.

Fragile, copiously milky, pileus 2in. broad, becoming pale.—Fr. Hawthornden, near Edinburgh.

118. **Lactarius ichoratus.** *Fr. Hymeno., p. 436.*

Pileus fleshy, thin, from rigid becoming soft, plano-depressed, unequal, smooth, glabrous, opaque, fulvous; gills adnate, somewhat crowded, from white becoming ochraceous; milk sweet, white.

Hereford. Oct., 1879.

119. **Hydnum scabrosum.** *Fr. Hymeno., p. 599.*

Pileus compactly fleshy, at first turbinate, then plane, ferruginous-umber, at first tomentose then scabrous with flocci fasciculated into crowded minute squamules; stem short, punctate with decurrent spines, cinerascens; spines greyish-brown, white at the apices.

On the earth in pine forests. Forres. Rev. J. Keith. Sept., 1879.

The blackish base to the stem is a striking character in this species.

- * **Sistotrema confluens.** *Pers.*

This rare fungus occurred in three localities near Forres this year—Altyre Woods, Chapelton Wood, and Rothiemurchus, in September.

120. **Clavaria incarnata.** *Weinm. Fries Hymeno., p. 678.*

Gregarious, simple, solid, cylindrical, flesh-colour, whitish-pruinose, purple within.

Varies from $\frac{1}{2}$ – $1\frac{1}{2}$ inch long.—Fr.

Terrington, Norfolk. Oct., 1879.

121. **Ræstelia carpophila.** *Bagnis. in Thumen Mycotheca Universalis. No. 1326.*

On the fruit of the common hawthorn.

August, 1879. Kings Lynn.

Although careful search was made, not a single specimen of the common form—*R. lacerata*—was observed. In the affected fruit the petals were still white and adherent, though they had all been shed for some time on the rest of the tree.

122. **Morchella gigas.** *Pers. Cooke's Mycogr., t. 86, f. 323.*

Pileus conical, margin free, somewhat undulated, brown, ribs forming perpendicularly elongated cells, anastomosing; stem squamulose, hollow, enlarged near the base; asci cylindrical;

sporidia ovate, slightly coloured, smooth, $\cdot 025\text{--}\cdot 027 \times \cdot 013\text{--}\cdot 016$ mm.; paraphyses stout, clavate at the apices, septate.

North Wootton. May, 1879.

Some of the specimens were 30 cm. (12 inches) in height. A very fragile species.

* **Morchella Smithiana.** Cooke *Mycogr.*, t. 83, f. 318.

Terrington St. Clements. June, 1879.

123. **Helvella infula.** Schæff. t. 119. *H. suspecta* Kromb. t. 16, f. 1-6. *H. infula.* Barla. *Champ.*, t. 42, f. 14-16. *H. suspecta.* Weber. *Pilz.* t. v., f. 1-1e. *H. infula.* Cooke *Mycogr.*, t. 92, f. 334.

Pileus lobed, deflexed, sometimes gyroso-nudulate, smooth, rufous-cinnamon, or purple-brown, much paler and tomentose beneath, margin adhering firmly to the stem, becoming undulated; stem thickened above and below, stuffed, then hollow, smooth, villous, pallid, or purplish white, often here and there irregularly lacunose; asci cylindrical; sporidia ellipsoidate, binucleate, $\cdot 018\text{--}\cdot 022 \times \cdot 008$ mm.; paraphyses septate, often twice or thrice branched, apices pyriform, coloured.

This species has occurred both in Scotland and England. The English specimens found in Norfolk were growing chiefly on wood, varying in size from 3 in. to 8 in. in height, and in considerable quantity.

124. **Peziza bulbosa.** Hedw. Cooke. *Mycogr.*, t. 48, f. 189.

Cups hemispherical, greyish-brown, minutely squamulose; disc nearly black; stem firm, squamulose, arising from a tuberous base; asci cylindrical; sporidia 8, subglobose, with a large nucleus, $\cdot 013 \times \cdot 01$ mm.; paraphyses stout, clavate at the summit.

Kings Lynn. July, 1879. On a garden lawn under hazel bushes.

125. **Peziza (Tarzetta, Cke.) muralis.** Sow. *Eng. Fung.*, t. 251.

Scattered, stipes short, expanding upwards into the turbinate fleshy cup, glabrous, pallid clay-colour; disc slightly concave or plane; asci cylindraceo-clavate; sporidia 8, ovate, $\cdot 014 \times \cdot 008$ mm.; paraphyses linear, rather stout.

Cups about $1\text{--}1\frac{1}{2}$ centimet. across.

By some oversight this species has been omitted from "English Flora," "Berkeley's Outlines," and "Cooke's Handbook." By the kind permission of the Rev. M. J. Berkeley we have been permitted to examine Sowerby's original specimen, and have given the result of the measurement of the sporidia above.

126. **Peziza (Pustularia, Cke.) indiscreta.** n. s.

Scattered or crowded, hemispherical, sessile, fleshy, somewhat verrucose, dark brown, margin thick; disc concave, black-brown; asci cylindrical; sporidia ovate, asperate, with one or two large nuclei, $\cdot 016\text{--}\cdot 018 \times \cdot 009\text{--}\cdot 01$ mm.; paraphyses linear, septate, rather clavate at the summits.

Cups from 3 mm. to 1 cent. across.

On the earth under lime trees. North Wootton.

127 **Peziza (Humaria) cervaria.** *Phil. Stevenson, Myco. Scot., p. 308.*

Gregarious or crowded, sessile, thick in the centre, thin at the crenulate margin, chestnut-brown; disc concave, waved; asci broadly cylindrical, abruptly narrowed at the base; sporidia 8, oblong-ovate; paraphyses linear, forked at the summits, abundant.

Cups 1-4 mm. across. Sporidia 0.15×0.07 mm.

This species closely resembles *P. hepatica*, Batsch., but differs in having much smaller sporidia, and slenderer paraphyses, which are not thickened at the apices, and are forked.

On roe-deer's dung. July and August. Grantown, N.B. Rev. J. Keith.

128. **Peziza (Humaria) bovina.** *Phil. Stevenson, Myco. Scot., p. 308.*

Gregarious, sessile, with obconic base, expanded, umber colour; disc umbilicate, waved, with paler margin; asci cylindrical; sporidia 8, oblong-ovate; paraphyses scarce or none.

Cups 8-12 mm. across; exterior cells of the cup very large; 8 mm. in diameter; sporidia 0.19×0.09 mm.

On cow dung. Grantown. Rev. J. Keith.

129. **Peziza (Humaria) Keithii.** *Phil. Stevenson, Myco. Scot., p. 308.*

Gregarious or crowded, sessile, thick, turbinate, concave, then expanded, dull salmon colour, smooth; disc nearly plane, margin obtuse; asci broadish, clavato-cylindrical; sporidia 8, ovate; paraphyses scarce or none.

Cups 5-8 mm. across, external cells small, 0.1 mm. diameter. Sporidia $0.15-0.18 \times 0.07$ mm.

This species has an outline much commoner amongst *Ascoboli* than the *Peziza*, being thick and fleshy, with the hymenium but slightly depressed, the form of a flattened sphere.

On horse dung. Waterford, Scotland. Rev. J. Keith.

130. **Peziza (Sarcos.) hirtococcinea.** *n.s.*

Sessile, scattered or crowded, fleshy, hemispherical, then expanded, dull scarlet; margin incurved, clothed with scattered, pale-brown, obtuse, septate hairs, longest on the margin; flesh pale scarlet; asci cylindrical; sporidia 8, ovate, with one or two large nuclei, 0.22×0.11 mm.; paraphyses rather slender, clavate at the apices, filled with scarlet granules.

The cups are 6-10 mm. across. The hairs below the margin shorter, often clavate, composed of a single cell. The white mycelium at times conspicuous below the cups.

On mossy spots in the earth in pine woods. Forres. The Rev. J. Keith.

131. **Peziza (Dasyscyphæ) crucifera.** *Phil. Gard. Chron., 1878, p. 397, fig. 71. Stevenson, Myco. Scot., p. 313.*

Minute, gregarious, stipitate, white; cups at first globose, then expanded, clothed with short, septate, white hairs, with clavate summits crowned with cruciform crystals; stem rather long, villous to the base; asci cylindrical-clavate; sporidia 8, cylindrical, or narrowly fusiform, straight, $0.06-0.08 \times 0.01$ mm.; paraphyses as

broad but longer than the asci, acutely pointed. Whole plant about 5 mm. high.

On fallen twigs of *Myrica gale*. Capel Curig, North Wales; also in Norfolk, Scotland, and elsewhere.

132. **Peziza (*Dasyscyphæ*) *Rhytisma*.** *Phil.*

Minute, gregarious, stipitate, white; cups at first globose, then expanded, clothed with short, white hairs bearing on their summits globular crystalline beads; stem rather long, villous to the base; asci cylindrical; sporidia 8, oblong-fusiform, $\cdot 003\text{--}\cdot 005 \times \cdot 001$ mm.; paraphyses as broad but longer than the asci, acutely pointed.

Parasitic on *Rhytisma acerinum*. Fr. Scotland. The Rev. James Keith.

This is distinguished from its allies by its habitat, size of sporidia, and the rough globose beads on the points of the hairs.

133. **Peziza (*Dasyscyphæ*) *aranea*.** *D. Ntrs. Micr. It. Dec. I., n. 1.*
Tricho-peziza, Sacc. *Michelia*, 1878, p. 253.

Cups minute, sessile, scattered, closed, then open, white, clothed with long white flexuous hairs; disc, when dry, pale yellow; asci clavate; sporidia 8, biseriate, oblong, or oblong-fusiform, $\cdot 007 \times \cdot 0015$ mm.; paraphyses filiform.

On the inside of the husks of the Spanish chestnut. Holme Lacy. Oct., 1879.

The cups are about $\cdot 1\text{--}\cdot 3$ mm. across. They are at first mere tufts of snow-white entangled hairs.

134. **Peziza (*Dasyscyphæ*) *œdema*.** *Desm. Ann. Sc. Nat., 1850.*
Stevenson, Myco. Scot., p. 317. P. epiphragmidium, Phil. in Herb.

Hypophyllous, sessile, very minute, somewhat crowded, globose, slightly pubescent, greyish-white, sub-tremellose; cups $\cdot 1\text{--}\cdot 15$ mm., seated on a brown tuberos subiculum; asci minute, claviform, often curved; sporidia 8, biseriate, fusiform, $\cdot 006\text{--}\cdot 009 \times \cdot 002$ mm.

It is a pleasure to bear our testimony to the extreme accuracy of the late M. Desmaziere, whose diagnosis given above of this interesting addition to our flora has required from us but few additions.

Parasitic on *Phragmidium* on decayed leaves of *Rubus*. Dolgelly, North Wales, and Scotland. Rev. J. Keith.

135. **Peziza (*Dasy*?) *nuda*.** *n. s.*

Scattered, plane or convex, with a long, solid, rather flexuous stem, pale orange-red, smooth, glabrous; asci cylindrical; sporidia 8, oblong or oblong-fusiform, $\cdot 005\text{--}\cdot 01 \times \cdot 002\text{--}\cdot 003$ mm.; paraphyses broad, longer than the asci, acutely pointed, filled with granules.

On the ground amongst moss in fir woods. Scotland. Rev. J. Keith.

5 mm. high, $2\frac{1}{2}$ mm. across disc.

This is an anomalous species, having the long pointed paraphyses not hitherto observed in any section besides *Dasyscyphæ*,

yet destitute of hairs of any kind that would justify placing it in that section. A more extensive series of specimens may throw some further light on its nature.

* **Peziza (Hymenoscyphæ) pseudo-tuberosa.** *Rehm. Asco., No. 106.*
On acorns. North Wootton. Nov., 1879.

136. **Peziza (Hymenoscyphæ) concolor.** *Phil. Stevenson, Myco. Scot. p. 321.*

Gregarious, minute, stipitate, pallid, or dirty white, firm, thin, hemispherical, roughish; margin minutely finabrate; asci cylindrical-clavate; sporidia 8, oblong, rounded at the ends, $\cdot 008\text{--}\cdot 01 + \cdot 002\text{--}003$ mm., simple; paraphyses filiform.

Cups $\frac{1}{4}$ –1 mm. across.

On hard decorticated wood. Scotland. April. Rev. J. Keith.

137. **Peziza (Mollisia) versicolor.** *Desm. Ann. Sc. Nat., 1853. XX., p. 230. Stevenson, Myco. Scot., p. 325.*

Very minute, sessile, white-hyaline, fragile, glabrous, at first globose, then turbinato-concave, slightly furfuraceous externally; margin sub-denticulate; asci clavate; sporidia 8, oblongo-fusiform, biseriate, $\cdot 01\text{--}\cdot 015 \times \cdot 003$ mm.

On fronds of dead *Pteris aquilina*. June. Scotland. The Rev. J. Keith.

We could not observe the change of colour which M. Desmaziere says this species assumes when punctured.

138. **Peziza (Mollisia) melatephra.** *Lasch. Rabh. Herb. Myco., No. 825. Stevenson, Myco. Scot., p. 326.*

Minute, gregarious or scattered, soft, glabrous, rugulose, erumpent, sessile, nearly black, whitish at the margin, hymenium pallid-cinereous; asci subclavate; sporidia narrowly fusiform, biseriate, $\cdot 012 \times \cdot 001$ mm., spuriously uniseptate; paraphyses slender.

On dead stems of *Carex*. Aug. Scotland. Rev. J. Keith.

139. **Peziza (Mollisia) excelsior.** *Karst. Myco. Fenn., p. 199. Stevenson, Myco. Scot., p. 326.*

Gregarious, sessile, disciform, convex, when dry concave, dirty white or cinereous; hymenium pallid; asci cylindrical, elongato-fusiform, ends pointed, numerous nuclei, becoming spuriously multiseptate, $\cdot 05\text{--}\cdot 065 \times \cdot 004\text{--}005$ mm., paraphyses filiform, branched.

On dead stems of *Arundo*. Aug. Scotland. Rev. Jas. Keith.

This is allied to *P. eustigiiformis*, B. & C., but differs in sporidia and structure of cup from that species.

140. **Peziza (Mollisia) fecunda.** *Phil. Stevenson, Myco. Scot. p. 326.*

Scattered, minute, at first covered by the epidermis, then erumpent, concave, when moist fuliginous, paler on the margin, disc fuscous black; asci broadly clavate; sporidia 8, fusiform with 3 to 4 large nuclei, $\cdot 025\text{--}03 \times \cdot 004\text{--}005$ mm.; paraphyses filiform, enlarged at the apices. Cups $\cdot 5$ mm. across.

The fruit in this species is large and abundant in comparison with the size of the plant.

On dead stems of *Eleocharis*. Aug. and Sept. Scotland. Rev. Jas. Keith.

141. **Peziza (Mollisea) ventosa.** *Karst. Myco. Fenn., p. 188. Stevenson, Myco. Scot., p. 326.*

Gregarious, sub-sphaerico-applanate, becoming slightly convex, at first totally cinerious, then cinerious black, disc ochrey-pallid or totally cinerio-nigricant, margin elevated, most frequently flexuous, obtuse; asci cylindraceo-clavate, or subcylindrical; sporidia elongato-fusiform, $\cdot 01\text{--}\cdot 02 \times \cdot 002\text{--}\cdot 0035$ mm.; paraphyses filiform.

On *Willow*. Spring. Scotland. Rev. J. Keith. Shropshire.

142. **Ascobolus viridulus.** *n.s.*

Scattered, sessile, hemispherical, concave, then expanded, and subemarginate, thick, pale yellowish green, coarsely granulated; asci clavate; sporidia 8, in one, sometimes two rows, elliptic, violet, becoming brown, longitudinally rimose, rimæ anastomosing, $\cdot 013 \times \cdot 006$ mm. Cups $\cdot 5\text{--}1$ mm. across.

On the rejectamenta of a bird (pigeon?).

Shrewsbury. Feb., 1878.

This has much the outward character of *Ascobolus furfuraceus* in a young state, but the sporidia are very much smaller.

143. **Ombrophila brunnea.** *n.s. Phil.*

Crowded, sessile, or sub-stipitate, concave, then expanded, becoming flexuous, yellowish-brown, glabrous; disc darker than margin; asci cylindrical; sporidia 8, ovate-oblong, rough bi- or multi-nucleate, $\cdot 016\text{--}\cdot 02 \times \cdot 005\text{--}\cdot 008$ mm.; paraphyses enlarged at the summits, adhering.

On herbaceous stems in damp spots. Forres. Rev. J. Keith.

144. **Phacidium calthæ.** *Phil. Stevenson, Myco. Scot., p. 344.*

Hypophyllus, innate, congregated on brown spots, erumpent, disciform, convex, cinerious; asci broadly clavate; sporidia oblongo-fusiform or sub-clavate, enucleate; paraphyses filiform, occasionally forked at the apices; sporidia, $\cdot 015\text{--}\cdot 023 \times 005\text{--}007$ mm.

On decaying leaves of *Caltha palustris*. Autumn. Scotland. Rev. J. Stevenson.

145. **Lophium læviusculum.** *Karst. Myco. Fenn., p. 246. Lophium mytilinum, Stev. Myco. Scot., p. 349.*

Perithecia gregarious, erumpent-superficial, sessile, linear-elongated, hysterioriform, black, nearly smooth, $\cdot 3\text{--}\cdot 7$ mm. long; asci fusiform elongated, $\cdot 54\text{--}\cdot 60$ mm. long, about $\cdot 06$ mm. broad; sporidia 8, fusiform-elongated, straight, or nearly straight, usually faintly triseptate, pale yellow, $\cdot 016\text{--}\cdot 022 \times \cdot 0025\text{--}\cdot 003$ mm. paraphyses numerous, crowded, slender.

On fir leaves. Forres. Rev. J. Keith.

The asci in our specimens are $\cdot 05 \times \cdot 004$ mm., and the sporidia $\cdot 015 \times \cdot 002\text{--}\cdot 003$ mm.

- * **Torrubia capitata.** *Tul.*

Magnificent specimens of this very rare *Torrubia* were found Oct., 1878, by Miss L. M. S. Pasley, in Hampshire.

146. **Hypocrea tremelloides.** *Fr. Sys. Myc. ii., p. 335. Fuckel, Symb. Mycol., p. 184.*

Fleshy, convex, with a compressed base, pallid, ferruginous, umber, perithecia immersed; asci cylindrical octosporous, $\cdot 08 \times \cdot 004\text{--}\cdot 005$ mm.; sporidia globose, hyaline, $\cdot 004\text{--}\cdot 005$ mm.

Sufton, Hereford. Oct., 1878. C. H. Spencer Perceval, Esq. Dinmore. Oct., 1878. C. B. P.

147. **Hypocrea citrina.** *Fr. forma. Fungorum, Karst. Myc. Fenn. ii., p. 204.*

On the hymenium of *Polyporus betulinus*. Fr. Daruaway Forest. Sep., 1879. Mr. Lind.

148. **Hypocrea rigens.** *Fr. El. ii., p. 61.*

Subcarneous, flattened, scarcely marginate, at length greenish-black, interior white, perithecia confined to the disc, scattered, asci linear, $\cdot 06\text{--}\cdot 08 \times \cdot 003$ mm. Sporidia 16, spherical, $\cdot 003$ mm.

On dead wood. Brandon. Nov., 1876.

This is the *Sphaeria lenta* of Schweinitz, not of Tode, and the *Hypocrea rufa* var. *umbrina* of Saccardo. Fung. Ven. Series, iv., 24; and Mycol. Ven., No. 689.

- * **Hypocrea alutacea.** *Fr.*

This plant has occurred two or three years at Dinmore, near Hereford. We believe it to be a parasitic *Hypocrea* on *Spathularia flavida*, as was first pointed out to us by Mr. C. E. Broome.

- 148*. **Hypocrea aureo-virida.** *Plow. & Cooke.*

Pulvinate then flattened, fleshy, pale yellow then orange, disc becoming olive. Perithecia confined to the disc immersed, asci linear. Sporidia 16, round, pale fuliginous, $\cdot 0037$ mm.

On rotten wood, oak and hazel. North Wootton. Nov., 1879.

149. **Hypomyces viridis.** *Karst. Myc. Fenn., ii., p. 211. Alb. & Schw. Consp., p. 8, t. vi., f. 8.*

Stroma very thin, widely effused, densely tomentose, yellow, becoming greenish. Perithecia very crowded, ovoid or spherical, apices conical, at length brown, almost black. Asci cylindrical, $\cdot 16 \times \cdot 007\text{--}\cdot 008$ mm. Sporidia eight uniseriate, elongate, straight or curved, simple or obscurely uniseptate, $\cdot 03\text{--}\cdot 036 \times \cdot 005\text{--}\cdot 006$ mm.

On some *Agaric* which had been attacked before it came out of the ground. At first golden yellow, then green.

Pl. 130 f. 1 a and b, represents the conidial state which was observed Sept., 1878; c and d the ascus and sporidia.

South Wootton, 1878-9.

150. **Hypomyces violaceus.** *Tul. Ann. Sc. Nat. t. xviii., 1860, p. 14, F. Carp. iii., p. 60.*

On *Fuligo varians*, in a saw-pit. Cawdor Castle. Sept., 1879.

151. **Hypomyces cervinus.** *Tul. Carp., iii., p. 51.*

The conidial state of this *Hypomyces*, *Mycogene cervina*, Ditm., was found at Castle Rising, on *Peziza acetabulum*, in May, 1872, and at Sufton Court, Hereford, Oct., 1878, by Dr. M. C. Cooke, on *Peziza macropus*.

- * **Hypomyces chrysospermus.** *Tul.*

Magnificent ascigerous specimens were found in Chapelton Wood, Forres, by the Rev. John Stevenson, in September of last year.

152. *Hypomyces terrestris*. *Plow. & Boud.*

Conidia (*Botrytis agaricina*, Link.), parasitic on Agarics, consisting of hyaline tubes, branching, bearing at the extremity oval or pyriform conidia, filled with transparent granular endochrome, $\cdot 025\text{--}\cdot 03 \times \cdot 01$ mm.

Ascophore. Stroma fleshy, rather thick, 1-2 cm. in diameter, pale flesh-coloured. Perithecia subglobose, immersed, ostiola conical, projecting, red. Asci cylindrical, $15\text{--}2 \times \cdot 015$ mm. Sporidia 8, fusiform, acute, sometimes appendiculate, hyaline, uniseriate, $\cdot 03\text{--}\cdot 04 \times \cdot 008\text{--}\cdot 01$ mm.

I have found this plant for several years, but always without perfect fructification, until 1878. The ascophore at first resembles some *Corticium*, growing upon the naked ground, overrunning mosses, &c., but always on the spot where an Agaric has recently decayed, which has been destroyed by the conidial form. *Lactarius rufus* is the most frequent host, but other Agarics are also attacked by it.

King's Lynn, 1875-6-7-8.

M. Boudier has also met with the same species in France, a specimen of which he was kind enough to communicate.

Plate 130, fig. 2, *a* natural size, *b*, perithecia magnified, *c*, ascus, *d*, sporidia, *e*, sporophores, *f*, conidiæ, more highly magnified.

153. *Nectria Plowrightiana*. *Sacc. Mich. p. 307. Plowright Sph. Brit., fasc. iii., No. 154.*

Perithecia gregarious, sub-superficial, soft, sub-globose, red, $\cdot 5$ mm. diameter, ostiola punctiform, blackish, asci clavate, $\cdot 09\text{--}\cdot 1 \times \cdot 02\text{--}\cdot 022$, sporidia 8, biseriate, cylindraco-fusiform, curved, $\cdot 04\text{--}\cdot 05 \times \cdot 006$ mm., 5-7 septate, enucleate, hyaline.

On dead stems of *Arctium lappa*, near Shrewsbury. Feb., 1878.

154. *Nectria ditissima*. *Tul. Carp. iii., p. 73, t. 13. figs. 1-4.*155. *Nectria ribis*. *Tode. Fung. Meck. ii., p. 31, t. 12, f. 103. Plow Sp. Brit. fasc. iii., No. 11.*

Cæspitose, stroma compact, perithecia subglobose, smooth, at first purplish-red, then brownish; ostiola papillate.

Asci clavati, $\cdot 09 \times \cdot 015$, sporidia fusiform, hyaline, uniseptate, not constricted, $\cdot 02 \times \cdot 006$ mm.

156. *Melanospora chionea*. *Corda. Icon. i., t. 7, f. 297. = Ceratostoma chionæum. Fr. S. v. Sc. p. 396. Sphæria chionia. Fr. Sys. Myco. ii., p. 446. Eckl. Symbol., p. 126.*

Perithecia scattered, sessile, globose, rugulose, pubescent, white; ostiolum often subulate, acute, yellowish. Asci broadly clavate, narrowed below into a stem. Sporidia biseriate, ovate, brownish, $\cdot 012 \times \cdot 008$ mm.

On fallen leaves of pine.

157. *Melanospora vervecina*. (*Desm.*) *Sphæria vervecina. Desm. Ann. Sc. Nat., 1842, p. 103, c. in Eckl. Sym., p. 126.*

Perithecia gregarious, minute, globose, depressed, flask-shaped, clothed with densely matted white hairs, seated on a brown tomentose subiculum; ostiolum very long, falcate, glabrous, brown,

having at the apex a pencil of white fibres. Asci clavate, very transparent. Sporidia 8, large, ovate, brown, nearly opaque, somewhat apiculate at each end, $\cdot 02$ mm. long by $\cdot 012$ mm. wide.

158. **Dothidea rimosa.** *Fr. Scirrha rimosa. Nke. Fekl. S. M., p. 221. Fr. Syst. Myc. ii., p. 427.*

Subcuticular, linear, oblong, bursting through the sheath in parallel fissures, stroma black, cells minute, crowded. Asci oblong, octosporous, $\cdot 082 \times \cdot 014$. Sporidia biserial, oblong, uniseptate, hyaline, $\cdot 02 \times \cdot 007$ mm.

Forming conspicuous black elongated patches on the stems of the common reed.

On *Phragmitis communis*. Castle Rising. 1879.

Scirrha depauperata, Fekl., is obviously merely a foliicolous condition of this species.

159. **Dothidea frangulæ.** *Fekl. Symb. Myc., p. 222.*

Stroma erumpent, orbicular, convex or plane, black, opaque, grey within. Asci oblong, stipitate, walls of asci thick, $\cdot 088 \times \cdot 016$ mm. Sporidia 8, biserial, oblong, obtuse at the ends, straight, unequally bilocular, not constricted at the septum, pale brown, $\cdot 022 \times \cdot 007$ mm.

On dead branches of *Rhamnus frangula*. Shrewsbury. 1875.

The sporidia of our plant agree in form and size with Fuckel's description, but appearances of secondary septa are observable in many instances.

160. **Nummularia gigas.** *n. sp.*

Erumpent, growing from the deeper portions of bark and sub-jacent wood, at first orbicular, then ellipsoid and elongate; upper surface black, concave, somewhat repand, rough from the prominent ostiola; stroma rather soft, cineritious then whitish. Perithecia confined to the lower part of the stroma, crowded, pyriform, mutually compressed, with long necks which terminate on the disc by prominent rounded black ostiola.

Asci cylindrical, stipitate, $\cdot 12\text{--}\cdot 15 \times \cdot 012\text{--}\cdot 015$. Sporiferous portion $\cdot 05\text{--}\cdot 06 \times \cdot 012\text{--}\cdot 015$ mm., sporidia 8, dark brown, uniserial, oval or subrotund, rather various in form and size, at length nucleate, $\cdot 01\text{--}\cdot 012 \times \cdot 008\text{--}01$ mm.

The whole plant is from 3 to 5 cm. long, by 1 cm. wide, and from 3 to 5 mm. thick.

On birch, bursting through the outer bark. Ringstead Downs. 1876.

Pl. 130, fig. 3, *a*, specimen natural size, *b*, section of the same, *c*, asci, *d*, sporidia.

161. **Diaporthe Chailletii.** *Nke. Pyren. Germ., p. 276.*

Stroma more or less widely effused, forming irregular black spots upon the affected stems. Perithecia small, subglobose or depressed, abruptly attenuated into a short neck; ostiola punctiform, scarcely prominent, conical. Asci narrowly clavate, octosporous, sessile, $\cdot 042 \times \cdot 006$ mm. Sporidia biserial, narrowly

fusiform, straight, acute at both extremities, hyaline at first and then quadripartite, $\cdot 012\text{--}\cdot 013 \times \cdot 002\text{--}\cdot 0003$ m.m.

On *Atropa belladonna*. Shrewsbury.

162. **Diaporthe importata**. *Nke. Pyren. Germ.*, p. 315.

Stroma effused, circumscribed by the blackened matrix. Perithecia small, globose, more or less depressed, ostiola short, punctiform. Asci narrowly oblong or subcylindrical, octosporous, sessile, $\cdot 066\text{--}\cdot 075 \times \cdot 009$ mm. Sporidia uni or biseriata, fusiform, obtuse to subacute at the extremities, fusiform, 4-nucleate, 4-partite, slightly constricted in the centre, $\cdot 015 \times \cdot 001\text{--}\cdot 005$ mm.

On *Lycium barbarum*.

163. **Diaporthe rumicis**. *Nke. (inedit.) Plow, Sphæc. Brit. iii., No. 41.* King's Lynn. On dead stems of *Rumex*.

We have seen no description of this species, which was determined from Italian specimens distributed by Prof. Passerini, of Parma.

164. **Valsa lauro-cerasi**. *Tul. F. Carp. ii., p. 196. Plow. Sp. Brit. fasc. iii., No. 21.*

On branches of cherry laurel. Shrewsbury.

165. **Lophiostoma angustatum**. *Pers. Syn., p. 55. Fuckel Syn. Myc., p. 158. Fr. Sys. Myc. ii., p. 470.*

Perithecia scattered, immersed, then prominent, globose, black; ostiola linear, equal, narrow; sporidia oblong, obtuse at both ends, slightly curved, 5 septate, with occasional longitudinal septa, $\cdot 024\text{--}\cdot 03 \times \cdot 008$ mm.

On willow. North Wootton. Nov., 1879.

Sporidia sometimes 7 septate, with one or two longitudinal septa.

166. **Lophiostoma quadrinucleatum**. *Kars. Myco. Fenn. ii., p. 85.*

Perithecia scattered, immersed upon a blackened spot, compressed; ostiolum linear, rather prominent, black, $\cdot 6$ mm. across; asci clavate, $\cdot 095\text{--}\cdot 1$ mm. long, $\cdot 016\text{--}\cdot 018$ mm. broad; sporidia 8, biseriata, oblong, obtuse at the ends, straight or nearly so, pale brown, three septate, four nucleate, scarcely constricted at the septa, $\cdot 025\text{--}\cdot 032$ mm. long, $\cdot 008\text{--}\cdot 01$ mm. broad; paraphyses filiform, slender.

On dead branches of *Rhamnus frangula*. North Wootton. 1876.

167. **Sordaria maxima**. *Niessl. Beitr., p. 38, t. ri., f. 42, a and b.*

Perithecia gregarious, cæspitose often confluent, ovoid, oblong or subpyriform, brownish-black, rugulose; asci clavate, cylindrical, stipitate, apex obtusely rounded, 4 spored; sporidia uniseriate, oblong, brownish-black, nucleate, involved in gelatine.

Perithecia $\cdot 6\text{--}12$ mm. in height.

Asci, sporiferous portion, $\cdot 14\text{--}\cdot 16 \times \cdot 02\text{--}\cdot 025$ mm.

Stem of ascus, $\cdot 265\text{--}\cdot 280$ mm. long.

Sporidia, $\cdot 034\text{--}\cdot 042 \times \cdot 018\text{--}\cdot 024$ mm.

Forres. Rev. J. Keith. On rabbit's dung.

168. **Sporormia minima.** *Awd. Hedwigia*, 1878, p. 66, t. 1, f. iii.

Perithecia globose, membranaceous, black when dry, olivaceous when moist; asci cylindrical or elongato-clavate, sessile, $\cdot 085 \times \cdot 012$ mm.; sporidia tetramerous, brown, surrounded by gelatine, $\cdot 032\text{--}\cdot 035 \times \cdot 006$ mm. All segments $\cdot 007$ mm. long, or perhaps with the terminal segments slightly longer.

On grouse dung. Sept. Aviemore. Rev. J. Keith.

* **Sporormia pulchra.** *Hansen. Fung. Fim., Dan., p. 113, t. ix., f. 1-6.*

Perithecia elongato-pyriform, black, with a neck straight or curved, often bent, greenish-grey, often semi-transparent, covered by mycelium, $\cdot 32\text{--}\cdot 42$ mm. high; asci cylindrical, nearly sessile, octosporous, $\cdot 16 \times \cdot 03\text{--}\cdot 038$ mm.; sporidia 7 septate, 8 jointed, constricted, involved in mucus brownish-black, $\cdot 047\text{--}\cdot 057 \times \cdot 012\text{--}\cdot 014$ mm.

On cow dung. Aviemore. Rev. J. Keith.

Plate 130 f. 4, *a*, ascus; *b*, sporidium, after Hansen.

169. **Sphæria (Clypeosphæria) hyperici.** *n. sp.*

Perithecia minute, buried in the substance of the bark, covered by the blackened shining epidermis; asci cylindrical or clavato-cylindrical, $\cdot 07\text{--}\cdot 09 \times \cdot 015\text{--}\cdot 02$ mm.; sporidia 8, uni or biseriate, hyaline, oblong, constricted, nucleate, various in size, $\cdot 015\text{--}\cdot 025 \times \cdot 005\text{--}\cdot 008$ mm.

This striking little species occurs on the dead stems of *Hypericum perforatum*. The sporidia are possibly triseptate, but although many specimens have been examined they have never been observed in this condition. One septum is central, another dividing the larger segment transversely.

King's Lynn. 1878-9.

Plate 130, fig 5, ascus and sporidia.

170. **Sphæria (Psilosphæria) Rhododendri.** *Melanomma Rhododendri. Rehm. Ascomy., No. 186 Plow. Sphær. Brit. iii., No. 47.*

On dead branches of Rhododendron. The Wrekin. February, 1878.

* **Sphæria revelata.** *B. & Br. Ann. N. H., No. 634, t. 11, f. 8.*

On *Symphoricarpos* and *Artemisia*.

Sporidia $\cdot 01\text{--}\cdot 015 \times \cdot 005\text{--}\cdot 008$ mm.

King's Lynn. 1877-8.

171. **Sphæria (Pleospora) graminis.** *Fekl. S. M., p. 139.*

Perithecia gregarious, free, moderate size, globose, becoming depressed, black, often covered with grey, lax, branched hairs as long as the diameter of the perithecium; ostiolum cylindrical, short, truncate, perforated; asci elongated, curved, $\cdot 0118$ mm. long, $\cdot 014$ mm. broad; sporidia 8, biseriate, cylindrical-fusiform, curved or straight, 10 septate, two terminal cells narrow, the third broader, $\cdot 038$ mm. long, $\cdot 007$ mm. broad, pale yellow; paraphyses filiform, branched, as long as the asci.

On *Phragmites communis*. Terrington. 1877.

172. **Sphæria aucupariæ.** *Lasch. Plow. Sphær. Brit. iii., No. 65.*

On living leaves of *Sorbus aucuparia*. Manchester, 1873. Mr. T. Brittain.

We have seen no description of this species, which is identical with specimens received from several Continental botanists.

173. **Sphæria filicum.** Desm. *Ann. S. Nat.* 1840, p. 187. *Aursswald, Syn. Pyren. Eur.*, p. 20, t. 6, f. 81. *Plow. Sp. Brit. fasc. iii*, No. 99.

Epiphyllus, spots sooty-black; perithecia crowded, minute, innate, slightly prominent, sub-globose, black; asci clavate; sporidia 3-4, oblong, binucleate, opaque.

On *Lastrea filis-mas*. Shrewsbury. 1875.

174. **Sphærella innumerella.** Karst. *Myco. Fenn. ii.* p. 182. *Plow. Sphæ Brit. fasc. iii.*, 98.

Perithecia hypophyllous, gregarious, erumpent spherical, pierced by a pore, black, .75-1 mm. broad; asci very shortly stipitate, cylindraceo-clavate, sometimes obliquely swollen below, .042-.051 mm. long, .008-.009 mm. broad; sporidia 6, nearly triseriate, clavato-fusiform, one septum in the centre, not constricted, straight or curved, hyaline, .017-.024 mm. long, sometimes .018-.021 mm., .003-.004 rarely, .005 mm. broad.

On *Potentilla comarum*. Shrewsbury. August, 1877.

WOOLHOPE CLUB, 1879.

(Continued from p. 78.)

Cortinarius (Hydrocybe) imbutus. Fr.

Pileus fleshy, convex, obtuse, smooth, gilvous, growing pale, rather fibrillose about the thin margin; stem solid, equal, even, whitish, violet at the apex; gills adnate, rather distant, broad, greyish violet, then cinnamon.—Fr. *Hym.*, 390.

In woods. Dinmore.

Gomphidius glutinosus, Fr. Cabalva.

„ viscidus, Fr. Cabalva.

„ maculatus, Fr. Cabalva.

Paxillus leptopus, Fr. Dinmore.

Hygrophorus irrigatus, Fr. Holm Lacy.

„ puniceus, Fr. Holm Lacy.

„ metapodius, Fr. Cabalva.

„ chlorophanus, Fr. Cabalva.

„ psittacinus, Fr. Cabalva.

Lactarius pyrogalus, Fr. Dinmore.

„ glyciosmus, Fr. Dinmore.

„ turpis, Fr. Holm Lacy.

„ uvidus, Fr. Cabalva.

„ theiogalus, Fr. Cabalva.

„ pallidus, Fr. Cabalva.

„ vietus, Fr. Cabalva.

„ trivialis, Fr. Cabalva.

Lactarius picinus. Fr.

Pileus fleshy, rigid, convex, then plane, umbonate, umber-brown, at first velvety, then with the disc becoming smooth, even; stem stuffed, rather spongy, even, smooth, paler; gills adnate, much crowded, ochraceous; milk acrid, white.—*Fr. Hym.*, 435; *Kromb. t.* 40, *f.* 20-22.

In pine woods. Foxley.

Russula cyanoxantha, *Fr.* Cabalva.

„ *lutea*, *Fr.* Cabalva.

„ *depallens*, *Fr.* Cabalva.

„ *Queletii*, *Fr.* Cabalva.

„ *fragilis*, *Fr.* Cabalva.

„ *emetica*, *Fr.* Cabalva.

Cantharellus cibarius, *Fr.*

„ *lutescens*, *Fr.*

„ *Houghtoni*, *Phil.* Holm Lacy.

Marasmius epiphyllus, *Fr.* Dinmore.

„ *androsaceus*, *Fr.* Dinmore.

„ *Hudsoni*, *Fr.* Foxley.

„ *confluens*, *P.*

„ *fætidus*, *Fr.* Holm Lacy.

Marasmius polyadelphus. Lasch.

Minute, snowy-white, rather tough. Pileus very thin, hemispherical, sulcate, flocculose; stem tough, floccose at the base; gills decurrent, almost fold-like.—*Fr. Hym. Eur.*, p. 165, sub *Omphalia*.

On dead leaves. Dinmore.

Marasmius splachnoides. Fr.

Inodorous. Pileus rather membranaceous, convex, then expanded and umbilicate, smooth, striate; stem horny, hollow, smooth, shining, reddish (brownish); gills somewhat decurrent, crowded, simple, and anastomosing, white.—*Fr. Hym.*, 478; *Fl. Dan. t.* 1678, *f.* 1.

Amongst pine leaves. Cabalva, Foxley.

Boletus larinus, *Fr.* Dinmore.

„ *elegans*, *Fr.* Cabalva.

„ *flavus*, *Fr.* Foxley.

Polyporus lucidus, *Fr.* Foxley.

„ *cæsius*, *Fr.* Foxley.

„ *dryadeus*, *Fr.* Holm Lacy.

„ *Schweinitzii*, *Fr.* Cabalva.

Merulius corium, *Fr.* Foxley.

Hydnum cyathiforme, *Schff.* Cabalva.

„ *auriscalpium*, *Fr.* Dinmore.

Radulum orbiculare, *Fr.* Foxley.

„ *fagineum*, *Fr.* Foxley.

Grandinia granulata, *Fr.* Dinmore.

Thlephora cristata, *Fr.* Dinmore.

Stereum sanguinolentum, *Fr.* Holm Lacy.

Corticium puteanum, *Fr.* Holm Lacy.

„ *comedens*, *Fr.* Holm Lacy.

Clavaria fragilis, *Fr.* Dinmore.

„ *abietina*, *Fr.* Foxley.

„ *Kunzei*, *Fr.* Holm Lacy.

„ *rugosa*, *Fr.* Holm Lacy.

Pistillaria quisquiliaris, *Fr.* Dinmore.

Tremella lutescens, *Fr.*

„ *albida*, *Fr.* Foxley.

„ *foliacea*, *Fr.* Foxley.

Nematelia encephala, *Fr.* Cabalva.

Cynophallus caninus, *Fr.* Foxley, Dinmore.

Leocarpus fragilis, *Dicks.* Foxley.

Trichia fallax, *P.* Holm Lacy.

Ceratium hydroides, *A. & S.* Holm Lacy.

Hymenula Platani. *Lev.* Holm Lacy.

Amphigenous. Receptacles gregarious, innate, then erumpent, minute, orbicular or ovate, pulvinate, reddish, seated on a dried spot. Spores ovate, or curved, rounded at the extremities.—*Ann. Sci. Nat.*, 1848, ix., 128. *Fusarium Platani*, *Mont. Ann. Sci. Nat.*, 1849, xi., 55.

On leaves of *Platanus*, chiefly on the veins.

Piggotia astroidea, *B. & Br.* Cabalva.

Fusicladium pyrinum, *Lib.* Holm Lacy.

Puccinia Circææ, *Pers.* Dinmore.

Geoglossum hirsutum, *P.* Dinmore.

Spathularia flavida, *Pers.* Dinmore.

Peziza cochleata, *Fr.* Foxley.

„ *badia*, *Fr.*

„ *macropus*, *P.* Dinmore.

„ *succosa*, *Berk.* Dinmore.

„ *trechispora*, *Curr.* Dinmore.

„ *hepatica*, *Batsch.* Dinmore.

„ *echinophila*, *Bull.* Holm Lacy.

„ *gregaria*, *Rehm.* Dinmore.

Peziza (Dasyscypha) aranea. *Not.* Holm Lacy.

Cups minute (0.1-0.3 mm.), scattered, whitish, delicately villous, sessile; asci cylindrical; sporidia linear (0.007 × 0.005 mm.).—*Klotzsch. Herb. Myc.* ii., 17.

On involucre of *Castanea vesca*.

Helotium fructigenum, *Bull.* Holm Lacy.

Trochila lauro-cerasi, *Fr.* Foxley.

NEW BRITISH LICHENS.

Communicated by the REV. J. M. CROMBIE, F.L.S.

The following *new species* of Lichens recently discovered in Great Britain have been recorded by Dr. Nylander in the "Flora," 1879, pp. 353-362, and 1880, pp. 10-13 :—

1. **Lecanora xantholyta.** *Nyl.*—Thallus vitelline, entirely leprose, thin, sublobate, subeffigurate at the circumference (K + purplish); apothecia not seen.

On limestone rocks; always sterile. Great Orme's Head (Holmes); Bathampton Downs (Joshua); near Stokesay, Shropshire (Leighton).

2. **Lecanora superiuscula.** *Nyl.*—Similar to *Lecanora complanata* Krb. (Arn. Exs., n. 496), but differing chiefly in the spores being definitely larger, 0.010-14 mm. long, 0.007-8 mm. thick. Spermatia arcuate, 0.018-25 mm. long, 0.0006 mm. thick.

On schistose rocks above Loch-na-Gat, Ben Lawers (Crombie, 1878).

3. **Lecanora phæleucodes.** *Nyl.* Thallus whitish, effuse, areolato-diffract; apothecia small, brown, biatoroid, immarginate; hymeneal gelatine bluish and then wine-reddish (especially the thecæ) with iodine. Spermatia arcuate, 0.016-20 mm. long, 0.0005 mm. thick.

On calcareous rocks, Island of Lismore, Argyleshire (Crombie, 1877).

Nylander observes that this is almost a variety of *L. erysibe*, but it has the external appearance of *L. leucophæa*, and approaches to *L. subalbens* *Nyl.*

4. **Lecidea illita.** *Nyl.*—Thallus subisabelline or pale-greyish, thin or very thin, applanate, areolato-diffract, areolæ angulose (Ca. Cl. + red); hypothallus very thin, umbrine-black; apothecia black, innate, 1 or 2 in each thalline squamule, minute, margined, umbonate in the centre; spores 8 næ, ellipsoid, simple, 0.012-16 mm. long, 0.008-0.011 mm. thick, paraphyses slender, somewhat sparing, perithecium and umbo in thin section brownish-black; hypothecium thin, subcolourless; hymeneal gelatine tawny wine-red with iodine; spermatia acicular, 0.005-6 mm. long, 0.0005 mm. thick.

On argillaceous schist in the W. of England (Larbalestier). It is closely allied to *L. umbonatula* *Nyl.*

5. **Lecidea tabidula.** *Nyl.*—Thallus blackish, thin or very thin, unequal, subscattered; apothecia black, minute, plane, somewhat margined, often aggregated, concolorous within; spores 8 næ, ellipsoid, 0.011-16 mm. long, 0.006-7 mm. thick, epithecium sordid bluish-black, paraphyses not well discrete, hypothecium (with the perithecium) dark-brown (or reddish-brown in thin section);

hymeneal gelatine bluish and then tawny wine-coloured with iodine.

On quartzose stones. Summit of Ben-y-gloe, Blair Athole (Crombie, 1876). It is comparable with *L. deparcula* Nyl., but differs in the characters of the thallus, the paraphyses and the reaction of the hymeneal gelatine.

6. *Lecidea nigrogrisea*. Nyl.—Thallus griseo-greyish, granulate-areolate, moderate or somewhat thin, the areolate convex, subshining (K. —, Ca. Cl. —); apothecia black, plane, thinly margined, sufficiently crowded; spores 8 μ , ellipsoideo-oblong, simple, 0.007-0.011 mm. long, 0.004-5 mm. thick, paraphyses submoderate, epithecium and perithecium blackish, hypothecium brown; hymeneal gelatine bluish with iodine, spermatia straight, 0.006-8 mm. long, 0.006 mm. thick.

On micaceo-schistose stones of a wall, Craig Tulloch, Blair Athole (Crombie, 1876). It most probably belongs to the section of *L. fumosa*.

7. *Opegrapha paraxanthodes*. Nyl.—Thallus pale-yellow or pale-greenish, thin, subsmooth, minutely areolate-rimose (when rubbed bright green); apothecia black, oblong or lineari-oblong, epithecium rimiform; spores 8 μ , oblong 5—usually 4—septate, 0.023-25 mm. long, 0.008-9 mm. thick; hymeneal gelatine tawny wine-reddish with iodine; spermatia straight, 0.005-7 mm. long, 0.0006 mm. thick.

On shady calcareous rocks, Achnanure, Galway (Larbalestier). It has entirely the appearance of *O. xanthodes* Nyl., but differs in the character of the spores.

8. *Opegrapha devulgata*. Nyl.—Nearly similar to, and perhaps a subspecies of, *O. vulgata*, with spermatia arcuate 0.008-0.012 mm. long, 0.0005 mm. thick.

On semiputrid trunks—Airds, Appin, Argyleshire (Crombie, 1877).

9. *Opegrapha nothiza*. Nyl.—Thallus whitish-griseous, thin, somewhat firm, minutely areolate-diffract, hypothallus brownish-black, obsolete or evanescent; apothecia black, oblongo-deformed, margined, epithecium plane; spores oblong, 3-septate, 0.015-17 mm. long, 0.0035-0.0045 mm. thick, paraphyses submoderate. Spermatia straight, 0.005 mm. long, 0.0005 mm. thick.

On quartzose rocks. Island of Jersey (Larbalestier). It is allied to *O. grumulosa*.

10. *Opegrapha actophila*. Nyl.—Thallus greyish, very thin, effuse or subevanescent; apothecia linear (or sublinear), subflexuose, epithecium rimiform or at length somewhat explanate; spores oblongo-fusiform, 5-septate, 0.021-31 mm. long, 0.005-6 mm. thick; spermatia straight, bacillar, 0.004-5 mm. long, 0.0005 mm. thick.

On maritime felspathic rocks. Island of Jersey (Larbalestier). It looks like *O. rimalis* saxicole, but it seems to be a distinct species.

11. **Endococcus exerrans.** *Nyl.*—*Peridia* pyreniiform, black, minute, on a very thin, blackish, scattered thallus; spores 8 μ , blackish, oblong, 1-septate, 0.010-15 mm. long, 0.0045 mm. thick; hymeneal gelatine wine-reddish with iodine.

On quartzose stones. Ben-y-Gloe, Blair Athole (Crombie, 1877). A species well distinguished by the attenuated spores.

In addition to these the following new subspecies and varieties from Great Britain and Ireland are also recorded by Nylander in the former of the above papers:—

* **Calicium curtiusculum.** *Nyl.*—Thallus whitish, granulated; apothecia shortly stipitate, capitula lentiform, whitish pruinose at the extreme margin; spores 0.006-0.010 mm. long, 0.0035-0.0045 mm. thick.

On wood and old pales. Cambridge (Larbaestier); Lewes, Sussex (Crombie). A subspecies of *C. quercinum*.

Lecanora Hutchinsia f. congregabilis. *Nyl.*—Thallus thin, subgranulated, apothecia often aggregate-acervulate; spermatia arcuate, 0.014-22 mm. long, 0.0005 mm. thick.

On shady rocks. Kylemore, Galway (Larbaestier).

Lecidea syncomista* perpallescens. *Nyl.*—Similar to the type, but with the apothecia pale or pale-testaceous, entirely diluted.

On the ground in crevices of rocks. Island of Lismore, Argyleshire (Crombie).

Lecidea glomerulosa* chloroleprodes. *Nyl.*—Thallus subleprose, effuse, continuous.

On the bark of trees. Cambridge (Larbaestier).

MYCOLOGIA SCOTICA.*

Unfortunately pressure of matter in our last issue prevented the insertion of a notice of this volume. It is with unfeigned pleasure that we now direct the attention of our readers to the fact that the long promised *Mycologia Scotica* has appeared, that it makes a good substantial volume, is clearly and neatly printed, and is, in fact, all that such a work should be.

No one was more fitted than the author to have undertaken it. He has made himself so practically acquainted with the higher fungi, as they are usually termed, of Scotland, and worked for some years so indefatigably in hunting them out, that his experience rendered him the right man for the work. Add to this his active participation in the work of the Cryptogamic Society of Scotland, and his zealous co-operation with all the Mycologists north of the Tweed, and his fitness is fully assured.

* *Mycologia Scotica*. The Fungi of Scotland and their Geographical Distribution by Rev. John Stevenson. Edinburgh, 1879.

The *Mycologia* commences with a Map of Scotland, divided into Botanical Districts. Then follows an introduction, giving an account of the aim and arrangement of the work, and the manner in which these have been carried out. This is succeeded by the *Flora* itself, extending over upwards of four hundred pages, giving names of the species, reference to description, locality, period, and geographical distribution. Descriptions of such species only are given as are not included in the "Handbook" or the "Myxomycetes." The book gives evidence of having been produced with care, and is furnished with an exhaustive index. Hence it will be seen that not only was its author the fittest person, but he has accomplished his work in such a manner as fully to satisfy his friends, and disarm his critics. As only a very limited number of copies were printed beyond the number of subscribers, those who may be desirous of possessing a copy of one, which will soon become a "rare book," must bestir themselves, ere it be too late. Application should be made to the Author, Glamis, Forfarshire.

SOME NEW SPECIES OF FUNGI FROM THE JURA AND THE VOSGES.

(*Communicated to the Woolhope Club, 1879.*)

By DR. QUELET.

(*With Plate 131.*)

Pluteus tenuiculus. *Q.*—Stem very slender, pruinose, white; pileus thin, subspherical (5-8 mm.), smooth, *striate*, bistre; gills broad, rounded, white, then rose-coloured; spores elliptic (0-01 mm.), containing 4-5 small granules, grouped together in the centre.

Spring. On heaths in the neighbourhood of la Rochelle. (G. Bernard).

Hydnum amicum. *Q.** (Nees d'Esenbeck, t. 241?).—Stem short, fibrous, with an arachnoid tomentum, tawny; pileus (0-1 mm.), undulato-repand, scalloped, thin, tomentose, whitish-grey; flesh fleshy-fibrous, cottony above, greyish, *striate* with purplish-livid streaks; smell and odour acid; spines short (0-2 mm.), thin, crowded, pale *lilac-grey*, turning brown when touched; spores spherical (0-004-0-005 mm.), verrucose, hyaline.

Summer. In rings and *cæspitose* in sandy woods. Vosges; Montmorency. (E. Boudier).

* In remembrance of pleasant excursions with my friend, E. Boudier, in the forest of Montmorency, in 1876, 1877, and 1879.

Rhizopogon suavis. *Q.*—Oblong, bullate (·0-·01 mm.), tomentose, pale yellow (changing to brown when exposed to the air), adhering to chesnut-coloured fibres, which terminate in an arachnoid net; substance *compact*, elastic, hyaline then olive, giving out a delicate odour of honey; cells rounded, with thin white silky walls; spores (5-7 on each basidium), pruniform (·0005-·7 mm.), ochraceous, with two nuclei.

Summer. Woods on the lower hills of the Jura.

Tuber fulgens. *Q.*—Globular (·01-2 mm.), *hollowed out*, *papillose-furfuraceous*, tawny-orange with the *opening sulphur-coloured*, substance hard, aromatic, apricot yellow or subconcolor, marbled with white veins; sporidia spherical (·03 mm.), alveolate, tawny.

Summer. Woods on the lower hills of the Jura. Differs from *T. excavatum* by its colour, tubercles and sporidia.

Peziza (Cupularis) ampelina. *Q.*—Cupule-shaped, waxy, fragile, hemispherical then scalloped (·02-3 mm.), whitish, granular-furfuraceous; hymenium *moist, shining*, dark-violet then purplish; sporidia lanceolate-ellipsoid (·015-·02 mm.), with two nuclei.

Summer. Gregarious on rubbish heaps (sand and cinders), in court-yards and gardens. Near *P. Boltonii*, *Q.* (Soc. Bot. Bul., t. xxv., p. 290).

Peziza (Humaria) muralis. *Q.*—Cupule-shaped, hemispherical (1-2 mm.), waxy, soft, villous, white, with a lemon-coloured villous margin; hymenium plane, light gold-colour then orange; sporidia cymbiform (·02-·3), with two or three nuclei.

From autumn to spring. On old walls, amongst *Bryum argenteum* and *Phascum muticum*.

Phialea lilacea. *Q.*—Cup-shaped, obconical (1-2 mm.), delicate, pellucid, smooth, violet-lilac; hymenium hollow, lilac-glaucous; sporidia lanceolate, elliptic (·008 mm.) with two nuclei.

Spring. *Fasciculate* on submerged wood in the marshes of the plains of Alsace. Differs from *Helotium clavus* by the form of the hymenium, hollowed out cone-shaped, by its violet colour and by its shorter lanceolate sporidia.

Helotium sulfurinum. *Q.*—Cup-shaped (·5-·1 mm.), substipitate, delicate, pruinose, white or tinged with lemon-colour; hymenium sulphur-yellow, shining, *hyaline white* in rainy weather; sporidia fusiform (·012 mm.), with four nuclei straight or incurved.

Spring. Gregarious on dry hazel branches. Lower hills of the Jura.

Helotium stagnale. *Q.*—Disk plano-convex (5 mm.), fleshy, firm, smooth, amber or livid flesh-colour, turning brown; stem (3-5 mm.), often very long (·01-·2), darker at the base (eventually wrinkled at the top); sporidia elongate-elliptic (·013 mm.), with two nuclei.

Spring. On chips, borders of ponds in the plains of Alsace.

Peziza (Mollisia) opalina. *Q.*—Discoidal-lentiform (1 mm.), waxy, firm, smooth, diaphanous, hyaline or lilac; hymenium plane, lilac or glaucous, *amethyst-colour* when dry; sporidia bacilliform (·012 mm.)

Spring. On submerged sticks on the edges of the turf-bogs of Alsace.

Lachnella lactea. *Q.*—Cupule-shaped, oval-spherical (1·2 mm.), firm, rough, with a fine, white, *silky* web, composed of toothed hairs; hymenium white, then cream-colour; sporidia acicular (·015 mm.), pluriseptate.

Spring. Gregarious on large plants in the lower hills of the Jura. (Confounded with *Cyphella villosa*, under the name of *Peziza villosa*, P.)

Ascophanus ruber. *Q.*—Globular-hemispherical (1 mm.), orange-red then brick-red, *rough* with long fine shining white hairs; hymenium plane, papillose; sporidia oblong-elliptic (·02 mm.), hyaline, with a nucleus.

Spring. Gregarious on cow-dung in the pastures of the Jura. Differs from *Ascobolus ciliatus*, Schm., by not having a white margin, and by its colourless sporidia.

NOTE.—An illustrative plate will be given in a succeeding number.

NEW YORK FUNGI.

By M. C. COOKE.

The following few specimens from the State of New York were communicated by W. R. Gerard, Esq. :—

Merulius ambiguus. *Berk. in N. A. Fungi.*

On trunks. No. 252.

Scleroderma geaster. *Fr.*

Subterranean form. No. 248.

Coniothyrium rubellum. *Cke.*

Sparsum. Peritheciis membranaceis, parvulis, brunneis, in maculis roseis nidulantibus. Sporis ovoideis, pallido-fuscis (·005 × ·003 mm.)

On naked wood. No. 259.

Discosia artocreas. *Desm.*

On acorns. No. 244.

Sphæropsis gallorum. *Schwz.*

On galls of *Celtis*. No. 251.

Diplodia celastri. *Cke.*

Cæspitosa, erumpens. Peritheciis atris, compressis, elongatis, vix papillatis. Sporis ellipticis, uniseptatis, brunneis, vix constrictis (·025 × ·01 mm.)

On twigs of *Celastrus*. No. 240.

- Diplodia compressa.** *Cke.*
 Diatrypeformis, erumpens. Peritheciis in cæspitulis erumpentibus congestis, atris. Sporidis late ellipticis, uniseptatis, nec constrictis, brunneis ($\cdot 02 \times \cdot 012\text{--}\cdot 014$ mm.)
 On branches of *Rhus* (?). No. 255.
- Pestalozzia concentrica.** *B. & C.*
 On leaves of *Castanea*. No. 264.
- Hendersonia glabra.** *Cke. in Grevillea.*
 On bark of *Betula*. No. 234.
- Epidochium nigricans.** *Fr. (Exosporium tiliaë. Ger.)*
 On *Tilia*. N. Y.
- Uromyces spermacoces.** *Schw.*
 On *Diodea*. No. 254.
- Uromyces asclepiadis.** *Cke. Uromyces Howei. Pk.*
 On *Asclepias*.
- Uromyces Desmodii.** *Cke. in Rav. Fung. Amer.*
 On *Desmodium*. No. 250.
- Puccinia tiarellæ.** *B. & C.*
 On *Tiarella*. Catskill Mts.
- Peziza cochleata.** *Bull.*
 On the ground. Catskill Mountains. No. 267.
 Apparently this species, but specimen bad.
- Peziza (Mollisia) cinerea.** *Batsch.*
 On rotten wood. Catskill Mountains. No. 257.
 On *Vitis*. New York.
- Peziza (Mollisia) chrysocoma.** *Bull.*
 On rotten wood. No. 257.
- Peziza (Tapesia) sanguinea.** *P.*
 On chips. No. 230.
- Helotium macrosporum.** *Pk.*
 On naked wood. No. 242.
- Diatrype atropunctata.** *Schwz.*
 On bark. No. 232.
- Eutypa limæformis.** *Schwz.*
 On bark. No. 235.
- Valsa prunastri.** *Fr.*
 On branches. Catskill Mts. Nos. 245. 237b.
- Massaria Gerardi.** (*Pro. tem.*)
 Sporidia very large, $\cdot 09\text{--}\cdot 012 \times \cdot 03$ mm., brown, 3-5 septate; but specimen too imperfect for description.
 On bark. No. 263.
- Dothidea ribesia.** *P.*
 On *Ribes*. No. 228.
- Psilosphaeria melasperma.** *Cke.*
 Erumpens, demum denudata. Peritheciis globosis, atris, lævis, subnitidis. Ostiola crasso, prominulo. Ascis cylindræis. Sporidiis elliptico-acuminatis, fuliginæis, nucleatis, demum uniseptatis, dein nigrescentibus, opacis ($\cdot 035 \times \cdot 012$ mm.)
 On naked wood. No. 237a.

Perithecia gregarious. Sporidia so dark and opaque when mature that the septum is masked.

Psilosphæria atramentosa. *Schwarz.*

On wood. No. 237.

Lasiosphæria canescens. *P.*

On wood. No. 227.

Conisphæria peniophora. *Cke.*

Sparsa. Peritheciis atris, conicis, ad basim applanatis, lævibus. Ascis amplis, clavatis. Sporidiis fusiformibus, medio constrictis, uni-dein leniter, 3-5 septatis, utrinque acuminatis, fuscis ($\cdot 01 \times \cdot 014$ mm.)

On bark. Nos. 236, 239.

Sporidia for some time hyaline, with a granular endochrome and uniseptate, at length becoming pale brown, with the endochrome divided.

Conisphæria pertusa. *P.*

On wood. No. 238.

Sphærella ilicella. *Cke.*

Epiphylla. Peritheciis punctiformibus, atris, in maculis orbicularibus, albis, sparsis. Ascis clavatis. Sporidiis fusoideis, hyalinis, uniseptatis, constrictis, cellulis binucleatis ($\cdot 02 \times \cdot 006$ mm.)

On leaves of *Ilex opaca*. No. 262.

Sphærella nigrita. *Cke. in Grevillea.*

On oak leaves. No. 265.

Without fruit.

REVUE MYCOLOGIQUE.

We would direct the attention of British Mycologists to the publication in France, under the above title, of a quarterly journal devoted to Mycology and Lichenology. It is edited by M. C. Roumeguere, and the price is twelve francs per annum. Hitherto it has consisted chiefly of abstracts and reprints, but it is hoped that when it attains better working order it will also permit original articles to preponderate. However, it would hardly be expected of us to pronounce any very decided opinion on the merits of a contemporary. We can only wish it success.

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MORREN, E. Correspondence Botanique. 7th edition.

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THEUMEN, F. Mycotheca Universalis, Cent. xv.

” Index Alphabeticus. Cent. i. to xii.

LE BRETON, A. Compte Rendu d'une Notice de M. Ch. Richon. “Bulletin Amis. des Sci. Nat. Rouen.”

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HANSEN, E. C. Contributions à la connaissance des organismes qui peuvent se trouver dans la bière et le moût de bière et y vivre.

PIROTTA, Dr. Sulla comparsa del Mildew o falso oidio degli Americani nei vigneti Italiani.

OUDEMANN, C. J. A. Fungi Neerlandica exsiccati. Cent. iii.

SPGAZZINI, C. Decades Mycologicæ Italicæ. 7 to 12.

FRIES, T. M. Lichens Collected during the English Polar Expedition, 1875-66.

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WINTER, G. Mycologische Notizen, in “Hedwigia,” No. 11. 1879. No. 1, 1880.

SCHRÖTER, J. Weisse Heidelbeeren, “Hedwigia,” No. 12. 1879.

GEHEEB, A. Moosflora des Westchen Sibiriens “Flora.” Oct. 21, 1879.

MÜLLER, Dr. J. Lichens Japonici. “Flora.” Nov. 1, 1879.

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HUBERSON, M. G. Brebissonia, revue de Botanique Cryptogamique.

HUSNOT, M. Revue Bryologique.

KIRK, T. On the Export of Fungus (*Hirneola*) from New Zealand. “Trans. Well. Phil. Soc. N. Z.”

ROUMEGUERE, C. Reliquæ Libertianæ, in “Revue Mycologique.” Jan., 1880.

INZENZA, G. Funghi Siciliani. Part 2.

PETIP, P. De l'Endochrome des Diatomeës, in “Brebissonia.” Jan., 1880.

KARSTEN, P. A. Symbolæ ad Mycologiam Fennicam. Part 6.

BERTOLONI, A. Sul parasitismo dei funghi, in “Nuovo Giorn. Bot. Ital.” Jan., 1880.

Grevillea,

A QUARTERLY RECORD OF CRYPTOGAMIC BOTANY AND ITS LITERATURE.

BRITISH DESMIDS.

An introductory List of Desmidiaceæ found in the British Islands, since "Ralfs' Desmidiæ."

The following list has been compiled with the view to the collection of information as to the occurrence of Desmidiaceæ in these Islands since 1848. Any additions are solicited, to be sent to the "Editor," at the earliest possible convenience, in order that they may be incorporated in a work now in course of preparation.

Gonatozygon Ralfsii, *DeBary. Conjug.*, p. 76.

(*Docidium asperum*. Ralfs., t. 26, f. 6.)

Archer, in Pritchard Infusoria (1861), p. 722.

Co. Tipperary (Ireland). Yorkshire.

Gonatozygon Brebissonii, *DeBary. Conjug.*, p. 77.

(*Docidium asperum*. Brebisson, in Ralfs, t. 26, fig. d.)

Archer, in Prit. Inf. (1861), p. 732.

(*Leptocystinema Portii*. Archer, in Nat. Hist. Rev., 1858, p. 251). Ireland.

Leptocystinema Kinahani. Archer, in Nat. Hist. Rev., Vol. V., p. 250.

Archer, in Prit. Inf. (1861), p. 722.

Ireland.

Sphærozosma filiforme. Ehr. *Meteorp.*, t. 1, f. 20.

Archer, in Prit. Inf. (1861), p. 724.

Archer, in Micr. Journ. (1869), p. 197.

Co. Tipperary (Ireland).

Spondylosium secedens. (DBy.) Archer, in Prit. Inf., 1861, p. 704.

(*Sphærozosma secedens*. DeBary.)

Archer, in Micr. Journ. (1871), p. 92.

Kylemore, Co. Galway (Ireland). Also in Essex.

Spondylosium pulchellum. Archer, in Prit. Inf., (1861), p. 724.

Archer, Micr. Journ., xvii. (1877), p. 191.

Ireland.

Tetrachastrum mucronatum. Dixon, in Nat. Hist. Rev. (1859) vi., p. 465.

Archer, in Prit. Inf. (1861), p. 725.

Co. Tyrone (Ireland).

Tetrachastrum oscitans. (Hass.) Dixon, in *Nat. Hist. Rev.* (1859), VI., p. 465.

(*Micrasterias oscitans*. Ralfs.)

Tetrachastrum pinnatifidum. (Kütz.) Dixon, *Nat. Hist. Rev.* (1869) vi., 455.

(*Micrasterias pinnatifida*. Ralfs.)

Micrasterias Thomasiana. Archer, in *Micr. Journ.* (1862), II, p. 239. Featherbed Mountain.

Micrasterias angulosa. Hantsch, in *Rabh. Alg. Eur.*, No. 1407.

Archer, in *Micr. Journ.* (1876), xvi., p. 109.

Co. Westmeath (Ireland).

Euastrum circulare. Hassall, *F. W. Algæ* (1845), p. 383, t. 90, f. 5. Ralfs' Desm., t. 14, f. 3 a.

Euastrum sinuosum. Lenorm. fide Ralfs Archer, in *Pritch. Inf.* (1861), p. 729.

Euastrum circulare, var. β . Ralfs' Desm., t. 13, f. 5, a, b, d.

Euastrum Jenneri. Archer, in *Prit. Inf.* (1861), p. 729.

Euastrum circulare, var. γ . Ralfs' Desm., t. 13, f. 5, c.

Euastrum binale. (Turp.) Ralfs. Desm. var. **angustatum.** Wittr., *Sotv. Alg.* t. 4, f. 8.

Archer, in *Micr. Journ.* (1873), xiii., p. 315.

Ireland.

var. **insulare.** Wittr. *Sotv. Alg.* t. 4, f. 7.

Archer, in *Micr. Journ.* (1873), xiii., p. 315.

Ireland.

Cosmarium undulatum. Corda *Almanac de Carlsb.* (1839), p. 243, t. 5, f. 26.

Archer, in *Prit. Inf.* (1861), p. 732.

Cosmarium pygmæum. Archer, in *Micr. Journ.* (1864), IV., 174.

Dublin Mountains.

Cosmarium exiguum. Archer, in *Micr. Journ.* (1864), IV., p. 178.

Dublin Mountains.

Cosmarium tuberculatum. Archer, in *Micr. Journ.* (1862), II, p. 247.

Piperstown Road, Co. Dublin.

Cosmarium tetragonum. (Näg.) Archer, in *Prit. Inf.* (1861), p. 732.

(*Euastrum tetragonum*. Næg.)

Archer, in *Micr. Journ.* (1877), xvii., p. 102.

Rocky Valley, Toole's Rocks, Connemara (Ireland). Scotland.

Cosmarium Brebissonii. Jacobsen, *Desm. Denm.*, t. 7., fig. 15. not Ralfs.

Archer, *Micr. Journ.* (1877), xvii., p. 305.

Co. Carlow (Ireland).

Cosmarium Portianum. Archer, in *Prit. Inf.* (1861), p. 733. *Micr. Journ.* (1860), p. 235.

= *Cosmarium orbiculatum*. DeBary *Conjug.* (1858), t. vi., f. 49, a, b. = *Cosmarium pseudomargaritifera*. Reinsch.

Dublin and Wicklow Mountains.

Cosmarium DeBaryi. Archer, in *Prit. Inf.* (1861), p. 735.

(*Pleurotenium cosmarioides*. DeBary.)

- Cosmarium punctulatum.** *Breb. Listo. p. 129, t. 1, f. 16. not Lundell.*
Archer, *Micr. Journ.*
Ireland.
- Cosmarium truncatellum.** *Perty Kleinst Lebensf. (1852), p. 209, t. 16, f. 13.*
Archer, in *Micr. Journ.* (1873), xiii., p. 99.
Toole's Rocks (Ireland).
- Cosmarium speciosum.** *Lundell, Desm. Succ. (1871), p. 34, t. 3, f. 5.*
Archer, in *Micr. Journ.* (1873), xiii., p. 101.
Rocky Valley (Ireland).
- Cosmarium tetrachondrium.** *Lundell, Desm. Succ. (1871), p. 38, t. 3, f. 2.*
Archer, *Micr. Journ.* (1873), xiii., p. 315.
Co. Tipperary.
- Cosmarium Hammeri.** *Reinsch. Alg. Mitt. Franken, p. 109, t. 9, f. 1.*
Crowe, *Micr. Journ.* (1873), xiii., 435.
Ireland.
- Cosmarium plicatum.** *Reinsch Algenflora, pl. 9, fig 1 d.*
Barker, *Micr. Journ.* (1873), xiii., 435.
(*Cosmarium sinuosum.* Lund. Desm. Succ., p. 47.)
(*Cosmarium quadratum.* Ralfs Desm., t. xv., f. 1 c., variety.)
Ireland.
- Cosmarium cyclicum.** *Lundell Desm. Succ. (1871), p. 35, t. 3, f. 6 d.*
Archer, *Micr. Journ.* (1877), xvii., p. 102; xv. (1875), p. 412.
The form recorded by Reinsch, was also found in Scotland and Ireland.
- Cosmarium minutissimum.** *Archer, Micr. Journ. (1877), xvii., p. 194.*
Ireland.
- Cosmarium lasiosporum.** *Archer, in Micr. Journ. (1879), xix., p. 123.*
Ireland.
- Cosmarium hexalobum.** *Nordst. (variety). Archer in Micr. Journ. (1879, xix., p. 441.*
Ireland.
- Cosmarium lobatosporum.** *Archer, in Micr. Journ. (1867), vii., p. 171.*
Kilbride, Co. Wicklow.
- Cosmarium annulatum.** (*Näg. sub. Disphinctium annulatum. Næg. Ein. Alg., p. 110.*)
Archer, in *Micr. Journ.* (1870), x., p. 92.
Rocky Valley, Mullingar (Ireland).
- Cosmarium tenue.** *Archer, in Micr. Journ. (1868), viii., p. 293.*
Ireland.
- Cosmarium Schliephackianum.** *Grun. in Rab. Fl. Alg., p. 167.*
Nordstedt, Desm. Aret. (1875), p. 24, t. 7, f. 15.
Archer, in *Micr. Journ.* (1876), xvi., 338.
Rocky Valley (Ireland).
- Cosmarium holmiense.** *Lundell Desm. Succ. (1871), p. 49, t. 2, f. 20.*
var. β .
Archer, in *Micr. Journ.* xv. (1875), p. 409.
var. **minor.**
Archer, in *Micr. Journ.* xvi. (1876), 344.
Ireland.

Cosmarium anceps. *Lundell, Desm. Suec.* (1871), p. 48, t. 3, f. 4.

Archer, *Micr. Journ.* (1875), xv., p. 409.

Bray Head (Ireland).

Cosmarium Reinschii. *Archer, in Micr. Journ.* (1876), xvi., p. 109.

Cosmarium, sp. *Reinsch. Contrib.* (1875), t. xviii., f. 4.

Ireland.

Cosmarium quinarium. *Lundell Desm. Sueciae* (1871), p. 28, t. 2, f. 14.

Archer, in *Journ. Bot.* (1874), iii., p. 93.

Ireland.

Cosmarium reniforme. *Archer, in Journ. Bot.* iii. (1874), p. 93.

(*Cosmarium margaritiferum*, var. *reniforme*. *Ralfs' Desm.*)

England, Wales, Scotland, Ireland.

Cosmarium hexastichum. *Lundell, Desm. Suec.* (1871), p. 33, t. 3, f. 13.

Archer, in *Journ. Bot.* (1874), iii., p. 93.

Ireland.

Cosmarium quadrifarium. *Lundell, Desm. Suec.* (1871), p. 32, t. 3, f. 12.

Archer, in *Journ. Bot.* (1874), iii., p. 93.

Ireland.

Cosmarium Nymannianum. *Grunow, in Rabh. Fl. Alg.* (1863), iii., 166.

Nordstedt Norges Desm. (1873), p. 17.

Archer, in *Journ. Bot.* (1874), iii., p. 93.

Ireland.

Cosmarium calcareum. *Wittr. Sotv. Alg.*, t. 4, f. 13.

Archer, in *Journ. Bot.* (1874), iii., p. 93.

Ireland.

Cosmarium variolatum. *Lundell, Desm. Suec.* (1871), p. 41, t. 2, f. 19.

Archer, in *Journ. Bot.* (1874), iii., 93.

Ireland.

Cosmarium pseudopyramidatum. *Lundell, Desm. Suec.* (1871),

p. 41, t. 2, f. 18.

Archer, in *Journ. Bot.* (1874), iii., 93.

Ireland.

Cosmarium pseudoconnatum. *Nordstedt Desm. Braz.* (1873), p. 214,

t. 3, f. 17.

Archer, in *Journ. Bot.* (1874), iii., 93.

Ireland.

Cosmarium gotlandicum. *Wittr. Sotv. Alg.*, t. 4, f. 14.

Archer, in *Journ. Bot.* (1874), iii., p. 93.

Ireland.

Xanthidium Robinsonianum. *Archer, in Micr. Journ.* xx. (1880), p. 114.

Ireland.

Xanthidium Smithii. *Archer, in Prit. Inf.* (1861), p. 736.

Wareham.

Arthrodesmus bifidus. *Breb. Liste*, p. 135, t. 1, f. 19.

Archer, in *Prit. Inf.* (1861), p. 736. *Micr. Journ.* (1870), p. 90.

Mullingar (Ireland).

Arthrodesmus tenuissimus. *Archer, in Micr. Journ.* (1864), iv., p. 175.

Dublin Mountains.

- Staurastrum OMearii.** *Archer, in Nat. Hist. Rev.* (1858), p. 254.
Archer, in Prit. Inf. (1861), p. 738.
 Ireland.
- Staurastrum glabrum.** (*Kütz.*) *Ralfs Desm.* (1848), p. 217.
Archer, in Prit. Inf. (1861), p. 738.
- Staurastrum Brebissonii.** *Archer, in Prit. Inf.* (1861), p. 739.
 (*Staurastrum pilosum*, *Breb.*)
- Staurastrum cristatum.** *Näg. Einz. Alg.* (1849), p. 127, t. 8 C, fig. 1.
 sub **Phycastrum.**
Archer, in Prit. Inf. (1861), p. 738. *Micr. Journ.*, 1866, p. 189.
Staurastrum nitidum, *Archer, Nat. Hist. Rev.* (1859), p. 463.
 Ireland.
- Staurastrum proboscideum.** (*Breb.*) *Archer, Prit. Inf.* (1861),
 p. 472.
 (*Staurastrum asperum*, var. β *Ralfs' Desm.*, t. 23, f. 12 b, c.)
- Staurastrum oxyacantha.** *Archer, in Nat. Hist. Rev.* vi. (1859), p.
 462, t. 33, f. 1. *Prit. Inf.* (1861), p. 742.
 Ireland.
- Staurastrum læve.** Var. **Cleveii.** *Wittr. Anteckn.* (1871), p. 18, f. 9.
Archer, in Micr. Journ. (1871), p. 92.
 Kylemore, Co. Galway.
- Staurastrum lanceolatum.** *Archer, in Micr. Journ.* (1862), II., p. 248.
 Dublin Mountains.
- Staurastrum longispinum.** *Bailey, Micr. Obs.* (1850), pl. 1, f. 17.
Archer, Micr. Journ. xii. (1872), p. 199 ; xvii. (1877), p. 192.
 Connemara (Ireland).
- Staurastrum Meriani.** *Reinsch, in Acta, Senckenb.* VI., p. 125, t. 23,
 D 1.
Crowe, Micr. Journ. (1873), xiii., p. 437.
 Woodenbridge, Co. Wicklow.
- Staurastrum ophiura.** *Lundell Desm. Suec.* (1871), p. 69, t. 4, f. 7.
Archer, Micr. Journ. (1873), xiii., p. 311 ; (1877) xvii., p. 192.
 Connemara.
- Staurastrum artiscon.** (*Ehr.*) *Lundell Desm. Suec.* (1871), p. 70,
 t. 4, f. 8.
Archer, in Micr. Journ. (1874), xiv., p. 214 ; (1877) xvii., p.
 192.
- Xanthidium* (?) *artiscon.* *Archer, in Prit. Inf.* (1861), p. 736.
 Connemara.
- Staurastrum sexangulare.** *Bulnheim, in Hedwigia* II., p. 51, t. 9 A,
 f. 1.
Archer, in Micr. Journ. (1877), xvii., p. 192.
 Connemara.
- Staurastrum Royanum.** *Archer, in Micr. Journ.* (1877) xvii., p. 103.
 Pass of Glencoe (Scotland).
- Staurastrum elongatum.** *Barker, in Micr. Journ.* (1869) IX., p. 424 ;
 (1871) XI., p. 93.
 (*Staurastrum terebrans.* *Nordstedt Norges Desm.* (1872), p. 34,
 f. 16.)
 Glengariff, Kylemore (Ireland).

Staurastrum arcuatum. *Nordstedt Norges Desm.* (1873), p. 36, f. 18.
Archer, in *Journ. Bot.* (1874), iii., p. 92.
Ireland.

Staurastrum oligocanthum. *Breb. in litt.*
Archer, in *Micr. Journ.* (1862), ii., p. 67; (1866) p. 189.

Staurastrum Griffithianum. *Näg. Ein. Alg.* (1849), p. 128, t. 8 C. 2.
Archer, in *Micr. Journ.* (1862), ii., p. 67; xiv. (1866), p. 67.
Regarded by some as a form of *Staurastrum spongiosum*.

Staurastrum Pringsheimii. *Reinsch. Alg. et Fung.* (1867), t. 5, f. B 2.
Archer, *Micro. Journ.* (1872), xii., p. 86.
Cos. Kerry and Cork (Ireland).

Staurastrum verticellatum. *Archer, in Micr. Journ.* (1869) p. 196.
Connemara (Ireland).

Staurastrum maamense. *Archer, in Micr. Journ.* (1869) ix., p. 200.
(*Staurastrum pseudo-crenatum*, *Lundell Desm. Suec.* (1871), p. 65, t. 4, f. 4.)
Archer, in *Journ. Bot.* (1874), iii., p. 93.
Galway (Ireland).

Staurastrum apiculatum. *Breb. Liste Desm. Norm.*, p. 142, t. 1, f. 23.
Archer, *Micr. Journ.* (1868), viii., p. 65.
Ireland.
Considered by some as a variety of *Staur. dejectum*, *Breb.*

Staurastrum pileolatum. *Breb. in Ralfs Desm.*, p. 215.
Close, in *Micr. Journ.* (1873), xiii., p. 99.
Leenane, Co. Galway (Ireland).

Staurastrum cerastes. *Lundell Desm. Suec.* (1871) p. 69, t. 4, fig. 6.
Archer, *Journ. Bot.* (1874), iii., 99; *Micr. Journ.*, xii. (1872), p. 202.
Ireland.

Staurastrum aversum. *Lundell Desm. Suec.* (1871), p. 59, t. 3, f. 27.
Archer, in *Journ. Bot.* (1874), iii., p. 93.
Ireland.

Staurastrum Sebaldi. *Reinsch, in Acta Senckenb.* vi., p. 133, t. 24 D 1.
var. β **ornatum.** *Nordstedt Norges Desm.* (1873), p. 34, f. 15.
Archer, in *Journ. Bot.* (1874), iii., p. 91.
Ireland.

Staurastrum inconspicuum. *Nordstedt Norges Desm.* (1873) p. 26, f. 11.
Archer, in *Micr. Journ.* x. (1870), 89. *Journ. Bot.* (1874), iii., p. 91.
South and west of Ireland.

Staurastrum paradoxum. *Meyen.*
var. β **longipes.** *Nordstedt Norges Desm.* (1873), p. 35, f. 17.
Archer, in *Journ. Bot.* (1874), iii., p. 92.
Ireland.

Docidium hirsutum. *Bailey, Micr. Obs.* (1850), pl. 1, f. 8.
Archer, *Micr. Journ.* (1879), xix., p. 438.
Ireland.

- Docidium nodosum.** *Bailey, Obs. t. 1, f. 4.*
 var. **dentatum.** Archer, in *Quart. Micr. Journ.* (1872), xii., 193.
 Connemara (Ireland).
- Docidium nobile.** *Richter, in Hedwigia* (1865), p. 129.
 Archer, in *Micr. Journ.* (1872), xii., p. 86.
 Co. Kerry, Co. Cork (Ireland).
- Docidium coronatum.** (*Ehr.*) *Breb. in Ralfs Desm., p. 217.*
 Archer, in *Prit. Inf.* (1861), p. 745.
 Archer, *Micr. Journ.* (1874), xiv., p. 214.
 Ireland.
- Closterium directum.** *Archer. Micr. Journ.* (1862), II., p. 249.
 Dublin Mountains.
- Closterium Pritchardianum.** *Archer, in Micr. Journ.* (1862), II., p. 250.
 Howth, Dublin Mountains.
- Closterium prælongum.** *Breb. Liste, p. 152, t. 2, f. 41.*
 Archer, in *Prit. Inf.* (1861), p. 747.
 Ireland.
- Closterium gracile.** *Breb. Liste, t. 2, f. 45.* (not of Lundell.)
 Archer, in *Prit. Inf.* (1861), p. 748.
 Ireland.
- Closterium Cynthia.** *Not. Desm. Ital., p. 65.*
 Archer, *Micr. Journ.* (1868), viii., p. 118.
 Ireland.
- Closterium aciculare.** *West, in Micr. Journ.* (1860), p. 153.
 Archer, *Micr. Journ.* (1862), ii., 31; (1866) vi., 181.
 Yorkshire, King's Co. (Ireland).
- Closterium lineæ.** *Perty Lebensf.* (1852), p. 206, t. 16, f. 20.
 Archer, *Micr. Journ.* (1866), vi., p. 71.
 Dublin Mountains. Also Essex.
- Closterium obtusum.** *Brebisson Liste, p. 154, t. 2, f. 46.*
 Archer, *Micr. Journ.* (1876), xvi., p. 338.
 Ireland.
- Closterium calosporum.** *Wittr. Anteck.* (1871), p. 23, f. 11.
 Archer, in *Micr. Journ.*, xiii. (1873), p. 100.
 Toole's Rocks (Ireland).
- Closterium Archerianum.** *Cleve, in Lundell Des Suec.* (1871), p. 77, t. 5, f. 13.
 Archer, *Micr. Journ.* (1873), xiii., p. 213.
 N. Wales. Galway (Ireland).
- Closterium lagoense.** *Nordst.*
 Archer, *Micr. Journ.* (1873), xiii., 213.
 Connemara.
- Closterium monotænium.** *Archer, in Micr. Journ.* (1876), xvi., p. 415.
 Ireland.
- Penium Nagelii.** *Breb. in Prit. Inf.* (1861), p. 751.
Closterium digitus. *Näg. Ein. Alg.* (1849), p. 107, t. 6 D.
 Ireland.

- Penium navicula.** *Breb. Liste Desm.* (1856), t. 2, f. 37.
 Archer, in *Prit. Inf.* (1861), p. 751.
 (*Penium Berginii.* Archer, *Nat. Hist. Rev.* (1858), v., p. 256.)
 Ireland.
- Penium Mooreanum.** *Archer, in Micr. Journ.* (1864), p. 179.
Penium pusillum. *Delponte*, t. 15, f. 34-36 (?).
 Dublin Mountains, and near Lough Bray.
- Penium spirostriolatum.** *Barker, in Micr. Journ.* (1869), ix., p. 194.
 Connemara (Ireland).
- Penium didymocarpum.** *Lundell Desm. Suec.* (1871), p. 84, t. 5, f. 9.
 Archer, in *Micr. Journ.* (1873), xiii., p. 213.
 N. Wales. Connemara (Ireland).
- Cylindrocystis diplospora.** *Lundell Desm. Suec.* (1871), p. 83, t. 5, f. 7.
 Archer, in *Journ. Bot.* (1874), iii., 94.
 Ireland.
- Mesotænium chlamydosporum.** *DeBary Conj.* (1858), p. 75, t. 7 D.
 Archer, in *Micr. Journ.* (1864), p. 124, t. 1, f. 1-19.
 Ireland.
- Mesotænium mirificum.** *Archer, in Micr. Journ.* (1864), p. 130, t. 1,
 f. 20-31.
 Ireland.
- Mesotænium violascens.** *DeBary Conj.* (1858), p. 74, t. 7 B.
 Crowe, in *Micr. Journ.* (1873), xiii., p. 319.
 Ireland.
- Spirotænia parvula.** *Archer, in Micr. Journ.* (1862) II., 254.
 Dublin Mountains (Ireland).
- Spirotænia truncata.** *Archer, in Micr. Journ.* (1862), II., p. 253.
 Dublin Mountains (Ireland).
- Spirotænia minuta.** *Thuret, in Breb. Liste.*
 Archer, *Micr. Journ.* (1868), viii., 68.
 (*Spirotænia erythrocephala* (Braun). Archer, in *Prit. Inf.*
 (1861), p. 751 ?)
 Carrig Mountain.
- Spirotænia tenerima.** *Archer, in Micr. Journ.* (1870), p. 203.
 Ireland.
- Cosmarium laeve.** *Rabh. var. septentrionale.* *Wille, Nova Zembla*,
 p. 43, tab. XII, fig. 34.
 Around London, and perhaps common throughout Britain.

Localities other than those enumerated, especially in England and Scotland, desired.

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OBSERVATIONS ON PEZIZA.

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It is manifestly an advantage, in whatever work we may be engaged, to pause occasionally, and take a calm and quiet retrospect, and, it may be, indulge in some reflections upon what has been attempted or achieved. It is with some such a feeling that we have been led to look over the volume of "*Mycographia*" which was recently brought to a close; and before we again proceed with that work, there are some reflections which it may not be deemed wholly inappropriate for us to communicate. They must be accepted as suggestive rather than dogmatic, and rather as subjects to be thought over than questions fully determined.

In order to assist in this retrospect it may be as well, in the first instance, to indicate what we conceive to be the principal features in *Peziza* which are necessary to be taken into account in the determination of a species, but before doing so we would quote two or three short sentences, written by one of the most persistent thinkers on these subjects, which in some measure induced us to enter upon these observations. "In genera having more than the average number of species in any country, the species of these genera have more than the average number of varieties." "In large genera the species are apt to be closely, but unequally, allied together, forming little clusters round certain other species." "Species very closely allied to other species apparently have restricted ranges." "No one supposes that all the individuals of the same species are cast in the same actual mould." "Individual differences generally affect what naturalists consider unimportant parts, but parts which must be called important sometimes vary in the individuals of the same species." "The amount of difference considered necessary to give any two forms the rank of species cannot be defined." These axioms are placed at the head of our observations, without any regard to sequence or comment, as they will have to be referred to hereafter. And now to return to the principal features which are to be considered in the determination of species in the large genus to which the larger portion of the first volume of "*Mycographia*" is devoted.*

1. *Habitat*. Although no one could be so rash as to assert that a species is dependent on its habitat, that fact must be taken into consideration. It may happen that the individuals of a certain species have invariably been found growing upon the naked ground, but should a closely allied form be found flourishing on rotten wood, or dung, or a plastered wall, this circumstance would be taken into account, not by itself, or on its own merits alone, but

* And yet less than half the number of species known to us have at present been illustrated.

in conjunction with other variations. Because, in the greater number of instances, the same species is not found in such diverse habitats. Usually a terrestrial species, such as *Peziza rutilans* is absolutely confined to soil, but instances are not unknown, as in *Peziza scutellata*, where the same species may occur as well on rotten wood as on naked soil, or *Peziza hepatica*, where the same species may be found on dung as well as on the earth. Exceptions of this kind are sufficiently rare to enable us to include the habitat as one of the minor considerations which have to be taken into account.

2. *Dimensions.* The average size of a species is usually indicated within limits to which the individuals are found to conform. Although the beautiful *Peziza aurantia* under ordinary circumstances reaches from one to two or three inches in diameter, yet the same species has been found growing under conditions in which the largest individual did not exceed a quarter of an inch. Nevertheless should such a species as *Peziza scutellata*, which is usually less than a quarter of an inch, be found attaining a diameter of two inches, such a circumstance would at once lead to an enquiry whether such a form could be the same species. All other conditions being equal, the same rule must apply to *Peziza scutellata* as to *Peziza aurantia*, notwithstanding that a dwarfed form of a large species is much more probable than a much increased form of a minute species. As with habitat, so with dimensions, a difference, however great, cannot be considered of itself as possessing specific value.

3. *Form.* Nothing is more variable than external form, which is subjected to influences of many kinds, and particularly to the conditions and circumstances under which the plant is developed. Yet the departure is seldom so great as to obliterate the character of the original type. In appreciating form as an element of classification, perhaps the most useful feature to regard is the presence or absence of a distinct stem. Distinctly stipitate species are seldom entirely sessile, probably never. Such species as *Peziza macropus* without a stem would be as rare as a white crow. In the minute cauliculous species there is often some difficulty in determining the exact limit between stipitate and sessile, but in the larger species this difficulty is seldom experienced. It is somewhat doubtful whether the presence or absence of a stem may not have a somewhat exaggerated importance in the Friesian arrangement. Under any circumstances the stem, being merely the axis of the vegetative system, can only be of secondary importance. Stipitate species will, if covered or obstructed, elongate the stem considerably in the efforts made by the cup to expose its disc to the light. In like manner when growing on a plane surface, and in full light, the stem will be much abbreviated. This may be well observed in *P. coccinea*, which from its habit of growing on sticks in old hedges has often to struggle for existence under difficulties. Apart from the stem other modifications of form seem to us too unstable,

except where a peculiarity is strongly marked, to prove of much value. Except in such rare instances as the oblique attachment of the cup to its support, as in *P. micropus* and *P. dochmia*, or the oblique or convolute forms of such species as *P. cochleata* and *P. onotica*. The auriculate form of the cup in *P. onotica*, *P. auricula*, and *P. leporina* appear to be as permanent characters as the stem of *P. macropus*. In other species, as in *P. alutacea*, *P. adæ*, &c., some individuals will possess the cochleate form, strongly developed, whilst other individuals will scarcely exhibit a trace. In a few instances the outward form is always sufficiently distinct and uniform for the identification of the species, but these instances are few and far between.

4. *Margin*. This partakes very much of the indefinite character which pertains to the form of the cup, except in such instances as those in which the margin has some appendages of a special character. Involution, revolution, laceration have no value, inasmuch as they may depend on age, moisture, or accidental circumstances. When the margin is distinctly dentate as in *P. cupularis*, *P.* or *P. subrepanda* C. and Ph., or furnished with rigid processes as in *P. Hindsii* or *P. tricholoma*, or closely contracted as in *P. geaster* and *P. sepulta*, so that it cannot expand without splitting into lobes, such features have their value, because they are comparatively permanent. Hence that feature which may be important in one species is entirely valueless in an other* for lack of definite character.

5. *Attachment*. Here again nine species may present no feature of importance, whilst the tenth may, in its mode of attachment to its matrix, furnish an almost distinctive character. Such rooting species as *P. ammophila*, *P. radiculata* and *P. pusio* are of this nature; and so also are the species which are attached by a tuft of black fibres like horsehair as *P. melastoma*, *P. hirtipes* and *P. japonica*. And so, to a less extent are those small species which produce an abundant white mycelium, upon which the cups are developed, and which remains for a long time as a thin byssoid stratum around the cups as in *P. omphalodes*, *P. domestica*, *P. chartarum*, and a few others, notably the majority of those included by us under the sub-generic name of *Pyronema*.

6. *Exterior*. The external surface of the cup may be naked, or downy, or clad with rigid hairs; or it may be mealy, or warted, or rugose. Whatever may be its character, those which are fugacious are scarce worthy of consideration, certainly should not enter into the distinctive features of a species. Crystals, granules, fugitive pubescence, are of a doubtful value when they are confined to youth and immaturity. The appendages of the exterior are often of considerable value when they are permanently developed. Hairs

* As all our illustrations are drawn from the sections represented in "Mycographia," it is to these alone that our observations are intended to apply.

agglutinated laterally into scales, or forming an adpressed fibrous coat, or elongated into distinct hairs or bristles growing singly or in bundles, are all features which seem to be of importance. So also is the nature of the hairs themselves, whether simple, or forked, or stellate, rough or smooth. The branching of hairs is to be treated with caution, since the simple hairs in some species exhibit a branching tendency when supplied with abundant moisture. In like manner the external cells, in species with a glabrous exterior, have furnished us by their size, disposition and texture with valuable aid in the determination of species possessed of little individual character. It will not escape notice, that, of all the external features which characterise the members of this genus, none have so much asserted their claim to recognition, or impressed us so strongly with their value, as an aid to classification, as the external cells and their appendages.

7. *Disc.* The hymenial surface, or disc of the cup is usually coloured, sometimes brightly, at others inconspicuously. At present we have failed to trace any relationship between this colouring and the habitat of the species. Very little reliance can be placed upon the colour of the disc as a distinctive feature. Carmine red varies sometimes to pink and even to white.* Yellows are apt to blanch or turn brown. Still there are some negative results which observation has furnished. Decided orange, such as *Peziza aurantia*, is not liable to variation, except in intensity. Verdigris-green, though not common, never seems to disappear or be superseded. When the cups have long been dried, and are moistened again, the green may be seen to pervade the substance of such species as *Peziza jungermanniæ*. Purples are less permanent, but to a considerable extent possess the same property. The same disc will sometimes vary very considerably with age, passing from flesh-colour to brown, from white to cinereous, and from cinereous to white. The colour of the disc in *Peziza* is, perhaps, scarcely more reliable than that of the petals in flowering plants, or, at least, uncultivated flowering plants.

8. *Texture.* This has but a narrow range in the present genus; tough, coriaceous, waxy, and other textures are excluded, and relegated to other genera, so that all which remain are assumed to have a soft, fleshy substance, containing a large percentage of water, which causes the plant to shrivel and collapse in drying. Nevertheless, some are more gelatinous than others, and become in drying reduced to a thin film. When a supposed species of *Peziza* retains its form and expanded disc, without shrivelling or cracking in the process of dessication, it may very reasonably be concluded that *Peziza* is not the genus to which it legitimately belongs. It need hardly be said that what is characteristic in the texture of one individual in a species will be so of all, since we have no experience

* A white variety of *Peziza coccinea* is sometimes to be found in company with its crimson relatives.

of any modification, as the result of any conditions in which the plant would sustain life. *Peziza succosa* appears to be always brittle and juicy; *P. cupularis* dry, and *P. omphalodes* little more than a drop of gelatine.

9. *Asci*. These are cylindrical in nearly all the large species of the genus. In the few species in which the asci are clavate, there is a manifest suspicion of their being degraded forms of *Ascophanus*. To this group belong *P. salmonicolor*, *P. hæmastigma*, *P. scatigena* and *P. cynocopa*. At the best they are not good typical forms of *Peziza*. Not long since Mons. Boudier expounded a very ingenious theory for the classification of the Discomycetes*, based on the mode of dehiscence of the asci. Notwithstanding its ingenuity, it is unfortunately absolutely impracticable. "It is only by examining the species in a fresh state that any perfection can be attained in a study so difficult as the classification of the *Pezizæ*," he says, and intimates also that fresh specimens are necessary for the determination of the dehiscence. The greater part of the new species which will have to be recorded will be on the basis of dried specimens, for which dehiscence cannot be determined. Hence, such a suggestion is analogous to proposing that for the future only living insects should be named and classified, a suggestion which would scarcely commend itself to the entomologist. The use of iodine as a re-agent in the study of the asci is open to a similar objection; it is only to be relied upon when fresh specimens are employed. Some authors seem to place almost equal reliance upon the length of the asci, as upon the dimensions of the sporidia. We do not object to the length of the asci being given, but we do not accord to this the value which has been assumed for it.

10. *Paraphyses*. We have no hesitation in according to the paraphyses a higher rank in classificatory importance than the asci. They are undoubtedly subsidiary organs in the life of the plant, but they possess more character, participate less actively in the great functions of the hymenium, are less subject to change, and of more practical value to the mycologist. Wherever these organs partake of a specialised character it is maintained not as the accidental eccentricity of an individual, but as an attribute of the species; at least, such is our opinion, based upon a multitude of observations. The mode and extent of branching may not always be identical. In some individuals they seem to be more highly developed than in others. Still, there is a general type peculiar to certain species, and another type common to other species, which facilitates determination, even where the sporidia are so similar as to furnish but little assistance.

11. *Sporidia*. However much we deprecate a system so artificial as the establishment of genera based on the form and septation of sporidia, we accord the place of honour to sporidia, in the series of features to be taken into account, in the diagnosis of a species.

* "Grevillea," Vol. viii., p. 45.

We are not advocating the exclusive use of the sporidia, or any one organ, in characterising a species, but, whatever others may be omitted, we regard these as essential to a complete character.

The form of the sporidia may vary within certain limits even in the same individual, but never to any considerable extent; what may be called the type of sporidia remains the same, whether elliptical, oval, globose, cylindrical, fusiform or linear. The size, nevertheless, may vary to a greater extent. It is noticeable that the proportions of the long to the short axis seldom undergo any great change in the same species when the sporidia are broad. When the sporidia are narrow or cylindrical, the variation is usually one of length. Compared with other fungi, the fructification of the *Pezizæ* exhibit no disadvantage; the uniformity in each species, of both size and form, are quite equal to that of the same organs in any other of the Ascomycetes.

The epispore is sometimes smooth, at others warted, spiny or reticulated. These forms are usually regarded as sufficiently stable to hold high rank in the essential character of a species. It may be safely affirmed that this feature is much more reliable than the septation of the sporidia in the Pyrenomycetes.

As to the contents of the sporidia, little can be said. We are well aware of the fact that some excellent and careful mycologists attach a considerable weight to the absence, presence or number of nuclei (so called) which characterise the sporidia. We never shared their faith in nuclei. After many years' experience, we still see no reason to alter this opinion. We have many times mechanically caused all the nuclei to disappear or be absorbed in the specimen under treatment. We have seen them three times as numerous in the sporidia from a given individual on one day as they were in the same individual a week afterwards. Tested in all ways, there seemed to be no reliance upon them in the large species on which our observations were made. Faith thus shaken has never encouraged us to renew the examinations, or place reliance where we did not deem it deserved.

The number of sporidia in each ascus scarce needs mention, as eight is so uniformly the normal number, that tetrasporous forms are rare, so rare, indeed, that we have no opportunity of ascertaining whether such species as *P. tetraspora* are ever octosporous.

Coloured sporidia occur but rarely, and it need hardly be said that the species in which they are found can dispense with many other distinctions, and rely upon that as almost all-sufficient.

There is but one other point which calls for remark. The "gelatina hymenea," so strong in Lichens, is seldom observable in the Discomycetes, because uncoloured or weak, and then chiefly in *Ascobolus*. In a few of the medium-sized *Pezizæ*, it is distinct, and particularly in *P. Phillipsii* and *P. jungermanniæ*. The rarity of any distinct intimation of its presence, imparts to this feature a value which it does not possess intrinsically, and only acquires on account of its rarity.

We have now briefly noticed all the features which have to be taken into account in the determination of *Peziza*. From the comparison of these an opinion has to be derived. It is not one character alone, however valuable, which should guide a determination, but a comparison of all, and a decision in favour of the preponderance. Diagnoses of species in which no attention is given to the hymenium, and especially to the sporidia, are entirely valueless; so also are those in which external features are ignored, and the form of the sporidia alone invested with a specific value. Species, as well as genera, and genera as well as species, should follow an uniform principle in their construction. It can only be the source of endless confusion to give undue prominence to any single organ to the prejudice of others. This results in distorted caricatures, and not faithful sketches, in the delineation of *Pezizoid* character. The recognition of the fact that "in large genera the species are apt to be closely and equally allied together, forming little clusters round certain other species" should not be interpreted as an indication of the imperfection of the genus, and the necessity for splitting it up into a string of minor genera, based on slight and insufficient characters. The present age promises to be better known in the future by its failures than by its successes in mycological classification. This is mainly due to a lack of a philosophical appreciation of the principles on which all scientific order is based.

By some such process as the comparison of its salient features, as we have indicated, with those of its allies, have the species already figured in the genus *Peziza* come into existence. It has been very rarely an exceptionally strong development of a single important character, but in the majority of instances a number of small differences, each insufficient in itself, which has determined a species. Wherever species are closely allied, and present only such differences as can be ascertained by careful and minute comparison, a far greater responsibility rests with the author of a new specific name, than in small genera where the species are few and distinct. In such cases it would be unjust and unfair to an author to affirm that he had multiplied species without just cause, whereas the failure would most probably lie with the critic, unaccustomed to such comparisons, or lacking in experience to temper his judgment with discretion. Manifestly it is a difficult task to appreciate the relation of species with species in a genus consisting perhaps of no less than a thousand. This difficulty is intensified in family clusters, where a number of species are closely ranged around a central type. How much this is the case with *Peziza* may be estimated by analysing one or two of its groups of species.

Let us, for example, select as a most marked and characteristic group, that which, in our final arrangement of species, we have denominated as the sub-genus *Scutellinia*. Here it is manifestly the old species *Peziza scutellata* of Linnæus, which is the centre of

radiation, or type. Around this one some twenty others are aggregated, presenting differences which can only be accurately estimated by a practised eye. It is unnecessary to revive the vexed question as to what constitutes a species. "The amount of difference considered necessary to give any two forms the rank of species cannot be defined," and yet such differences will be found to exist, whether we call the different forms by the name of "species" or "varieties." If we are to revert to some such catholic notion of a species, as that of its including within it all those forms which may reasonably be supposed to have descended from a common parent, then all which we have called species in the "red group" of the subgenus *Scutellinia*, would be regarded as varieties of some original *Peziza scutellata* from which, in the course of generations, the others have diverged. The *theoretical* species is that of a family descended from an original typical pair, the *practical* species is founded on comparison of existing differences, which are shared by a group of individuals. The two ideas should not be confounded.

We have in *Peziza scutellata*, L., a small sessile species, ranging from about one-tenth to one-fourth or one-third of an inch in diameter. The exterior covered with rigid, more or less elongated, dark brown hairs. The disc reddish, to bright crimson. Sometimes growing on wood, sometimes on the bare ground. The substance of the cup fleshy, the asci cylindrical, the paraphyses strongly developed, enclosing coloured granules, and the sporidia elliptical, about .002 mm. by .012 mm. in size, with an uncoloured epispore exhibiting a tendency to become granulated.

If we accept this as a sufficient character for the species, then the whole group, of which *P. scutellata* is the centre, constitutes but a single species. By reference to the figures already given (in the work cited) this will be abundantly manifest. If we select only those which have a reddish disc it will be found that they naturally range themselves in two parallel series, in one of which the epispore of the sporidia is smooth, in the other more or less rough. The rough spored series will include *P. miniata*, Fekl., *P. ampullacea*, Limm., *P. geneospora*, B., *P. umbrorum*, Fekl., *P. Texensis*, B., *P. hirta*, Schum., *P. Cubensis*, B. & C., *P. badioberbis*, B., *P. Lusatiæ*, Cke., *P. Margaritacea*, B., *P. vitellina*, Pers. (the only divergence being in its egg-yellow colour), *P. crinita*, Bull (in which the sporidia become brownish when mature), *P. strigosa*, Pers. and *P. labellum*, Pers. Here then we have no less than fourteen species which agree in the epispore of their elliptic sporidia being rough. To these *P. stictica*, B. & C., might be added; although the epispore is described as punctate, this is a point difficult of determination, and the punctate dots resemble depressed warts quite as much as depressed puncta. In fact, analogy leads to the conclusion that, unless the evidence is strong to the contrary, the markings should be regarded as slight elevations rather than depressions.

Of these species—two are Cuban, one Indian, one North American, one Australian, and one common to New Zealand and Ceylon, whilst the remaining nine are European, some of them being common also to other parts of the world. That “species very closely allied to other species have restricted ranges,” is here illustrated by *Peziza Cubensis*, B. & C., *P. Texensis*, B., which appear to be confined to Cuba and Texas, where they represent the European *P. umbrorum*, Fekl. Also in *P. margaritacea*, B., in Australia, and *P. badio-berbis*, B., in New Zealand and Ceylon, as the representatives of *Peziza hirta*, Sch., of Europe. The other exotics are *P. stictica*, B. & C., and *P. geneospora*, B., which have not been found out of Cuba.

Apart altogether from geographical distribution, these species might be compared in all their individual features, but this is scarcely necessary for our present purpose; we may, nevertheless, see how much they accord in respect to average dimensions. These are given below uniformly in milimetres—

	DIMENSIONS.	HABITAT.	LOCALITY.
<i>miniata</i> , Fekl.	... 10-25 mm.	on ground	*Europe.
<i>ampullacea</i> , Lim.	... 15-20 „	„ ground	Europe.
<i>geneospora</i> , B.	... 15-25 „	„ wood	India.
<i>umbrorum</i> , Fekl.	... 6-10 „	„ ground	*Europe.
<i>Texensis</i> , B.	... 5-6 „	„ ground	Texas.
<i>hirta</i> , Sch.	... 5-8 „	„ ground	*Europe.
<i>Cubensis</i> , B. & C.	... 3-6 „	„ wood	Cuba.
<i>badio-berbis</i> , B.	... 5-7 „	„ wood	Ceylon, N.Z.
<i>Lusatiæ</i> , Cke.	... 5-8 „	„ wood	*Europe.
<i>Margaritacea</i> , B.	... 5-7 „	„ wood	Australia.
<i>vitellina</i> , P.	... 5-6 „	„ ground	Europe.
<i>crinita</i> , Bull.	... 4-5 „	„ wood	Europe.
<i>strigosa</i> , P.	... $\frac{1}{2}$ -1 „	„ ground	Europe.
<i>labellum</i> , P.	... 1-2 „	„ ground	Europe.
<i>stictica</i> , B.	... 6-8 „	„ ground	Cuba.

There are three large species, which are commonly twice or thrice the size of any of the rest, and two minute species, leaving ten of nearly uniform size, from 3 or 4 to 7 or 8 milimetres in diameter. It cannot be denied that even the widest range, between one and twenty-five milimetres, is by no means impossible for a single species.

The next aspect in which we may review these fifteen species is that of their fructification, usually regarded as one of the most important characters in the diagnosis of a species. As already intimated, the whole of these are characterised by rough elliptical sporidia, ranging between certain approximate limits of size. The relative proportion of the short to the long diameter must, however,

* Also in other parts of the world.

be regarded as more invariable than the absolute dimensions. The latter are given in the following table—

	LENGTH.		BREADTH.
<i>miniata</i> , <i>Fckl.</i>	... ·02-	·022 mm.	·009 mm.
<i>ampullacea</i> , <i>Lim.</i>	... ·022	„	·012 „
<i>geneospora</i> , <i>B.</i>	... ·03	„	·01- ·011 „
<i>umbrorum</i> , <i>Fckl.</i>	... ·02-	·022 „	·018 „
<i>Texensis</i> , <i>B.</i>	... ·022-	·023 „	·013 „
<i>hirta</i> , <i>Sch.</i>	... ·025	„	·01 „
<i>Cubensis</i> , <i>B. & C.</i>	... ·018-	·02 „	·011 „
<i>badio-berbis</i> , <i>B.</i>	... ·022-	·025 „	·012- ·014 „
<i>Lusatiae</i> , <i>Cke.</i>	... ·025	„	·015 „
<i>Margaritacea</i> , <i>B.</i>	... ·025-	·027 „	·016- ·018 „
<i>vitellina</i> , <i>P.</i>	... ·022	„	·015 „
<i>crinita</i> , <i>Bull.</i>	... ·02	„	·012 „
<i>strigosa</i> , <i>P.</i>	... ·02-	·024 „	·01 „
<i>labellum</i> , <i>P.</i>	... ·02	„	·011 „
<i>stictica</i> , <i>B.</i>	... ·016	„	·011 „
<hr/>			
Maximum	... ·03	„	·018 „
Minimum	... ·016	„	·009 „
Average	... ·0222	„	·0126 „

The whole relationship of the sporidia of one species to those of another cannot be comprised in a table. By this means we can arrive at the fact that the sporidia of *P. hirta* in their length and breadth bear the proportion of 5 to 2, and in *P. geneospora* nearly of 3 to 1, whilst in *P. umbrorum* it is only 11 to 9; but in the same manner we cannot realize the degree of attenuation towards the extremities, or the greater or less perfection of the elliptical form. Could all these differences result from a modification of an original typical form? Undoubtedly, and unhesitatingly, we must concede that such a circumstance is quite within the limits of possibility; because, although “individual differences generally affect what naturalists consider unimportant parts, yet parts which must be called important sometimes vary in the individuals of the same species.” This is especially true with regard to the sporidia in *Peziza*. Undoubtedly they are important parts, and, as a rule, comparatively permanent, but occasionally they exhibit within themselves just those differences which are relied upon as of paramount importance in the separation of species. There is one fact, however, which may to some extent compensate for this admission. Hitherto there has been no indication found of the passage of the perfectly globose sporidia to the short ones of the elliptic type. No link has been found to unite them. *Peziza trechispora*, with its globose sporidia, notwithstanding the similarity of all other features, is removed by this one all-sufficient character, if by no other, from the fifteen species which we have enumerated. If all the said fifteen, and the seven others hereafter

named, were united as one species, *P. trechispora* would still remain outside as an independent type.

If we compare also with the series having rough sporidia those in which the sporidia are smooth, but with the external features of the cups the same as in the rough spored series, we find the following representatives :—

	DIMENSIONS.	HABITAT.	LOCALITY.
scutellata, <i>L.</i>	... 5- 8 mm.	on wood	*Europe.
setosa, <i>N.</i>	... 5- "	„ wood	Europe.
Kerguelensis, <i>B.</i>	... 12-18 "	„ ground	{ N. Zealand and Kerguelen.
carneo-sanguinea, <i>Fckl.</i>	2- 5 "	„ ground	Europe.
Sequoia, <i>Phil.</i>	... 5- "	„ twigs	California.
umbrata, <i>Fr.</i>	... 5- 6 "	„ ground	*Europe.
lentiformis, <i>P.</i>	... $\frac{1}{2}$ 1 "	„ ground	Europe.

Of the seven species only two are exotic; the residue are European. One species is large, and analogous to *P. miniata*. One species is minute, and analogous to *P. strigosa*. The remaining five species are of a medium size. The only one which exhibits any departure from the usual habitats is *P. sequoia*, which occurs on the dead foliage and twigs of *Sequoia* in California. Were it not for the sporidia being smooth, all of these, except *P. umbrata*, might be referred to rough spored types. The link which unites them is *P. scutellata*. The following are the measurements of the sporidia :—

	LENGTH.	BREADTH.
scutellata, <i>L.</i>	... .02- .022 mm.	.011-.013 mm.
setosa, <i>N.</i>	... .02 "	.01 "
Kerguelensis, <i>B.</i>	... .023-.025 "	.017-.02 "
carneo-sanguinea, <i>Fckl.</i>	... .02 "	.01 "
Sequoia, <i>Phil.</i>	... .017-.02 "	.012-.013 "
umbrata, <i>Fr.</i>	... .018 "	.009 "
lentiformis, <i>P.</i>	... .019 "	.01 "
Average	... .02 "	.012 "

The average size is very nearly the same as in the rough spored series.

The only important point which arises in respect to this group, and its relationship to the preceding one, is that of the rough or smooth epispore of the sporidia. It has generally been considered, and with some reason, that the character of the epispore is a tolerably safe guide. When we speak of permanence in relation to any organ, it must be always understood in a modified sense. There is no absolute permanence, and to characterise the roughness or smoothness of the epispore as a good permanent character, means only that it is comparatively permanent, or as much so as in the most stable of vegetable organs. For all practical purposes

the roughness or smoothness of the epispore, in the mature sporidium, is accepted as a satisfactory independent basis for the establishment of a species. That of two individuals, agreeing in every other particular, the one of which has smooth and the other rough sporidia, this feature has been held sufficient for their recognition as distinct species. It is, perhaps, a condition seldom realised, of perfect identity in every point save one, and yet, in such an extreme case, it is doubtful if any valid objection would be urged to the acceptance of the epispore as final. The same could not be safely affirmed of any other character. It is the only one on which general reliance would be placed. In the face of this strong evidence there would appear to be an insuperable barrier to regarding the seven species last named as continuous with the first series of fifteen; and yet evidence may be produced to prove that in one of the most common of smooth spored species, unmistakable transitions may be found. We have examined specimens of *Peziza scutellata* from localities widely apart, from Great Britain, several European countries, North America, and other parts of the world, and observed with interest the modification of the epispore from a perfectly smooth surface, through minute granulation to a most decided warted surface. If it should be urged in opposition to this fact, that, according to admission already made, the roughness of the spore is an efficient character, and that the rough spored and smooth spored *P. scutellata* are distinct species, in reply we contend that we have found the same two forms growing side by side, and further, the same two forms co-existing in the same individual. The appearance of sporidia having a smooth epispore in an individual *Peziza*, the mature sporidia of which are rough, may be explained by the fact that immature sporidia do not exhibit the roughness which is characteristic of them when fully mature. Those who have had any extended experience in the examination of the hymenium of *Peziza* are aware that it is often with extreme difficulty that immature sporidia can be forced out of the asci in which they are generated, and that rough sporidia acquire their roughness before they leave the ascus. It is reasonable, therefore to assume that free sporidia, which have voluntarily left their asci and are still smooth, are likely to remain so, such being their normal condition. When free sporidia, with a smooth epispore, are encountered in the hymenium of a *Peziza* and at the same time also sporidia with a rough epispore, either enclosed in asci or free, it may fairly be assumed that both are the production of the same individual. There is one other aspect in which this phenomenon may be contemplated. It may be objected that, after all, *Peziza scutellata* is not a smooth spored species when fully matured under favourable conditions. That longer time, or certain other circumstances are essential for the perfection of the sporidia, which only occasionally, and under exceptional conditions, attain their highest state of perfection with a rough epispore. To this

we can only urge in reply that we have arrived at the conclusion that *P. scutellata* may be an exceptional species, but, at any rate, although usually the epispore is smooth, it has the power, under certain circumstances, of producing sporidia with a rough epispore. Unless we are much mistaken, although we have no notes to refer to, this is not an isolated instance. There is an impression that *Peziza gregaria* Rehm., which is not uncommon in England, has with us smooth sporidia, but that both Mr. Phillips and myself have examined Continental specimens, in one instance, with a rough epispore. The *Peziza*, and its sporidia, are scarcely to be confounded with any other species.

It is of but little consequence whether we call these twenty-two forms of *Peziza* so many varieties of one type, or give them names and call them twenty-two species, they have an undoubted close relation with each other, so close that it requires but little hesitation to confess that they may all be descended from some original *Peziza scutellata*, within the limits of historic times. Without the use of the microscope, it is doubtful whether even to Linnaeus himself they would have appeared as any other than *Peziza scutellata*.

What shall we say of parts having a less permanent character than the sporidia, such as the appendages of the external surface? We know well enough what is the general feeling amongst botanists as to the pubescence of leaves, but mycologists have not yet attained to the same impression as to the woolliness of the peritheci-um in *Sphaeria* or the hairy external surface of the cup in *Peziza*. In some cases this pubescence is very fugitive, delicate, and, in our opinion, of little or no classificatory value. In others, and particularly in the group under notice, the hairs are most pronounced, highly-developed, numerous, persistent, and deeply-coloured. Yet if we will follow them from the most highly-developed of half-a-millimetre in length, to the small short hairs of *Peziza Texensis*, we shall find a gradation terminating in what are no more than the hair-like prolongations of the external cells of the cup. Through this simplest form *Peziza Chateri*, Sm. is the link that unites the naked red *Pezizæ* of terrestrial habits with the section of *Scutellinia*. Through *Peziza Chateri* and *P. macrocystis* we enter another compact group, but with less startling affinities than those which we have reviewed in detail.

If it were necessary to illustrate still further our views with regard to certain groups of closely-related species, we might indicate *P. stercorea*, P., *P. alpina*, Fekl., *P. coprinaria*, C., and *P. scubalonta*, C. and G., with their relations to *P. Dalmeniensis*, C., *P. theleboloides*, A. and S., and other allies. And in addition thereto that section which we have called *Sepultaria*, having as types such species as *P. sepulta*, Fr., and *P. arenosa*, Fekl. Already our remarks have reached the extreme limits of our space, and hence we must commend our imperfect observations to the consideration of all those who are specially interested in this subject.

DESCRIPTIONS OF PLATES 131, 132, 133.

Plate 131, illustrating Dr. Quelet's Fungi of the Jura :—

- Fig. 1. *Hydnum amicum*, Q.
- „ 2. *Pluteus tenuiculus*, Q.
- „ 3. *Tuber fulgens*, Q.
- „ 3a. *Rhizopogon suavis*, Q.
- „ 4. *Peziza ampelina*, Q.
- „ 5. *Helotium sulfurinum*, Q.
- „ 6. *Helotium stagnale*, Q.
- „ 7. *Mollisia opalina*, Q.
- „ 8. *Ascophanus ruber*, Q.
- „ 9. *Phialea lilacea*, Q.
- „ 10. *Lachnella lactea*, Q.
- „ 11. *Mollisia mitralis*, Q.

Plates 132 and 133, illustrating New Zealand Fungi, see page 54 :—

- Figs. 1-2. *Cantharellus umbriceps*, Cke.
- „ 3-4. *Polyporus salpinctus*, Cke.

Mesopus, minimus. Pileo campanulato, vel tubæformi, umbrino, demum atro-umbrino, glabro, subnitido, striato; margine sublacerato, reflexo; stipite gracili, elongato, concolori, subvelutino; poris irregularibus, subangulatis, pallidioribus, brevibus; margine lacerato-dentatis.

On dead wood. Bay of Islands, New Zealand. (Dr. Berggren.) A very curious little species, from one inch high, figured natural size.

- Fig. 5. *Peniophora crustosa*, Cke.
- „ 6. Metuloids from hymenium of the same.
- „ 7. *Cyphella Zealandica*, C. & Phil., natural size.
- Figs. 8, 9. Cup enlarged, with section.
- Fig. 10. External hairs.
- „ 11. Spores $\times 400$.
- „ 12. *Coryne sulcipes*, Cke., enlarged
- „ 13. *Paurocotylis echinosperma*, Cke., natural size.
- „ 14. Section of same, magnified.
- „ 15. Spores magnified 400 diam.
- „ 16. Spore further magnified.
- „ 17. *Geoglossum hirsutum*, var. *leotioides*, natural size.
- „ 18. Sporidium of same $\times 400$.
- „ 19. *Helotium phormium*, Cke.
- „ 20. Section of cup.
- „ 21. Ascus and sporidia of *Helotium phormium*, Cke.
- „ 22. *Dermatea fumosa*, C. & Phil., natural size.
- „ 23. Section of cup enlarged.
- „ 24. Sporidia $\times 400$.
- „ 25. *Hysterium phormigenum*, C. & Phil., natural size.
- „ 26. *Perithecium* enlarged.

- Fig. 27. Section of same, transverse.
 „ 28. Sporidia of *Hyst. phormigenum* $\times 400$.
 „ 29. Perithecia of *Nectria Zealandica*, Cke., enlarged.
 „ 30. Section of same.
 „ 31. Sporidia $\times 400$.

Plate 133—

- Fig. 1. *Berggrenia aurantiaca*, Cke., natural size.
 „ 2. Section of same.
 „ 3. Cells of exterior $\times 400$.
 „ 4. Section of pileus, with hymenium on the inner surface, magnified.
 Figs. 5, 6. Asci and sporidia $\times 400$.
 Fig. 7. Spores of *Bactridium magnum* $\times 400$.
 „ 8. *Xylaria apiculata*, Cke., natural size.
 „ 9. Section of capitulum enlarged.
 „ 10. Sporidia $\times 400$.
 „ 11. *Xylaria Zealandica*, Cke., natural size.
 „ 12. Portion of capitulum enlarged.
 „ 13. Sporidia $\times 400$.
 „ 14. Sporidia of *Massaria australis*, Cke. $\times 400$.

REPLY TO DR. M. C. COOKE'S CRITICISM OF PAPER
 ON "VARIABILITY OF SPHÆRIA QUERCUM, SZ."

By J. B. ELLIS.

In the last number of "*Grevillea*," the editor of that Journal makes some statements with regard to my paper on *Sphæria Quercum*, published in the "Proceedings of the Academy of Natural Sciences of Philadelphia" last March, which need correction. He says, "It matters not that the sporidia vary in size and form, that in some (of the species) they should be obtuse, in others rather acute at the extremities, in some hyaline, in others deep brown." Dr. Cooke, who has examined the specimens, must have known that these various forms of sporidia instead of being characteristic of different species are all to be found in the same perithecium, the narrow and acute forms being in fact only young or imperfect. As to the sporidia being "hyaline in some and in others deep brown," the record in "*Grevillea*" contradicts that statement, so far at least as the species of C. and E. are concerned, *Melogramma Aceris* alone excepted; and even in this species my specimens have the sporidia hyaline. *S. eriostraga* is also said to have the sporidia brown and biseptate; but it is added that these were free spores, the sporidia actually observed in the asci being hyaline. In my previous paper I stated, and subsequent observations has confirmed the statement, that brown biseptate spores are

found in *all* the different forms, but as yet not in asci. They occur but sparingly it is true, but a careful and patient search is sure to reveal their presence. I wish here to amend my original statement so far as the colour of the sporidia is concerned. In all fresh specimens examined, the sporidia are hyaline. Some specimens on *Quercus alba* and on *Vaccinium Pennsylvanicum*, both of which had been poisoned, have brown sporidia, but as the colour may be due to the action of the poison, it will be safer to assume that the sporidia are hyaline till the examination of fresh and living specimens shall show them to be brown.

It is asked why twenty other specimens having similar sporidia were excluded from the list? Simply because I had not actually examined specimens of these species, and it was not intended to give mere opinion, but to state facts actually observed. As to "ignoring all variations of internal structure" and "discarding all external features," I am willing to let the specimens speak for themselves.*

* I intended to add to the original paper a foot note, designating all the forms with perithecia not united in a stroma *var. simplex*, but as no other additions could be made after the article was in type, I was obliged to content myself with adding this note with pen and ink to the copies sent me for distribution. (*Reprinted from Proc. Acad. Soc., Phil.*)

NOTE TO THE ABOVE.—I have printed this "reply" in fairness to the writer, but I do not purpose to continue the controversy, which, in common with others of a similar nature, would only tend to foster ill-feeling, and be of no interest to the public at large. Mr. Ellis has an undoubted right to the opinions he has professed, and a foregone conclusion would not be shaken by any evidence which I might offer. The type specimens are still in my possession, as well as original preparations of the fructification, and analytical drawings of all the species, so-called. In time these will find a place in some public institution, where they may be consulted by all concerned in the subject. I am quite content to wait and abide by the verdict of unbiassed judgment. My opinion rests upon the identical specimens which I have examined, and on no others. I much regret any difference of opinion between myself and Mr. Ellis; and as this difference relates to species published in our joint names (in many instances), but which Mr. Ellis thought fit to impugn, it became my duty to accept his judgment as publicly as he had made his criticisms, or, if I could not do this, to utter my protest. The latter course is the one which I followed, and with that I am now content to abide. Controversies of this kind are interminable, great consumers of time, and seldom profitable to any one. It is with no disrespect to Mr. Ellis that I decline his challenge, but I find time all too short for working purposes to be wasted in fruitless discussion.

M. C. COOKE.

ON HYMENOCHÆTE AND ITS ALLIES.

By M. C. COOKE.

The genus *Hymenochæte* was established by Leveillé for the reception of all those species, previously included in *Stereum*, which bore on the Hymenium coloured rigid setæ. We alluded to this genus when writing of *Peniophora*, and proposed to enumerate the species which had come under our observation. The following are all the genuine species we have examined :—

* MESOPUS.

1. **Hymenochæte reniformis**, (Fr.), *Lev. Ann. Sci. Nat.*, v. 1846, p. 151
In Brazilian specimens, setæ attenuated to an obtuse apex, $\cdot 07$ to $\cdot 1$ mm. long, and from $\cdot 014$ – $\cdot 02$ mm. diameter at base.

var. **damæcornis**, *Lev.*

- Hymenochæte damæcornis*, *Lev. Ann. Sci. Nat.*, v., 1846, p. 151.
In Cuban specimens, setæ long and slender, $\cdot 1$ – $\cdot 12 \times \cdot 01$ mm.
In St. Domingo specimens, setæ more robust and acute, $\cdot 05$ – $\cdot 06 \times \cdot 012$ – $\cdot 015$ mm.

Evidently the setæ are very variable, and profuse in all the forms in this species.

St. Domingo, Cuba, Venezuela, Brazil.

** APUS.

2. **Hymenochæter ubiginosa**, (Schr.), *Lev. Ann. Sci. Nat.* 1846, p. 151.
Stereum rubiginosum, Fr. *Hym.*, p. 641.
Setæ long and slender, $\cdot 1 \times \cdot 005$ mm.
Europe, U. States, India, Tasmania.

3. **Hymenochæte tabacina**, (Fr.), *Lev. Ann. Sci. Nat.* 1846, p. 151.
Stereum tabacinum, Fr. *Hym.*, p. 641.
Setæ robust, $\cdot 07 \times \cdot 012$ – $\cdot 014$ mm., sometimes $\cdot 08 \times \cdot 015$ mm.
Europe, Arctic America, U. States.
Stereum striatum, Fr., sometimes quoted as of this genus, has no setæ, and is not a *Hymenochæte*.

4. **Hymenochæte Boltoni**, (Sacc.)
Stereum Boltonii, Sacc. *Michelia*, i., p. 239.
Setæ clavate, attenuated at the base, $\cdot 07$ – $\cdot 08 \times \cdot 01$ – $\cdot 011$ mm., smaller in resupinate form.
Europe.

5. **Hymenochæte crocata**, (Fr.), *Berk.*
Stereum crocatum, Fr. *Hym.*, p. 641.
Setæ robust, $\cdot 08 \times \cdot 012$ mm.
Europe, United States.

6. **Hymenochæte rheicolor**, (Mont.), *Lev. Ann. Sci. Nat.* v. (1846), p. 151.
Setæ slender, $\cdot 1 \times \cdot 006$ mm.
India.

7. **Hymenochæte læta**, Berk. in Herb. Berkeley.
Thelephora læta, in Herb. Montagne.
 Setæ few, minute and scattered, $\cdot 025 \times \cdot 004$ mm.
 British Guiana.
8. **Hymenochæte attenuata**, Lev. Ann. Sci. Nat., v. (1846), p. 152.
 Setæ ob-clavate, $\cdot 09\text{--}\cdot 1 \times \cdot 01$ mm.
 West Indies, United States, Cuba.
9. **Hymenochæte badio-ferruginea**, (M.), Lev. Ann. Sci. Nat. v. (1846)
 p. 152.
 Setæ slender, $\cdot 05\text{--}\cdot 06 \times \cdot 006$ mm., in New York specimens.
 Setæ $\cdot 08 \times \cdot 007$ mm., in specimens from Maine.
 New York, Maine and Carolina (U. S.).
10. **Hymenochæte avellana**, Lev.
Stereum avellanum, Fr. Hym. Eur., 642.
 Setæ numerous, subfusiform, straight or curved, of variable
 length, $\cdot 09\text{--}\cdot 13 \times \cdot 006\text{--}\cdot 008$ mm.
 United States, Europe.
11. **Hymenochæte strigosa**, B. & Br. in Ceylon Fungi, No. 610.
 Setæ few, inconspicuous, $\cdot 04\text{--}\cdot 045 \times \cdot 007\text{--}\cdot 008$ mm.
 Ceylon, Australia.
12. **Hymenochæte aspera**, B. & C. in Cuban Fungi, No. 420.
 Setæ numerous, acute, $\cdot 06\text{--}\cdot 075 \times \cdot 005$ mm.
 Cuba, Venezuela.
13. **Hymenochæte cacao**, B. in Cuban Fungi, No. 416.
 Setæ rather numerous, $\cdot 03 \times \cdot 005$ mm.
 India, Cuba, Venezuela.
14. **Hymenochæte Sallei**, B. & C., Cuban Fungi, No. 417.
 Resembling *H. cacao*, B. Setæ rather larger, $\cdot 035 \times \cdot 006$ mm.
 Cuba, Cordova.
15. **Hymenochæte rigidula**, B. & Br. Linn. Journ., x., p. 334.
 Setæ numerous, $\cdot 06 \times \cdot 006\text{--}\cdot 007$ mm.
 Ceylon, Cuba.
16. **Hymenochæte phæa**, Berk. in Herb.
Stereum phæum, Berk. in New Zeal. Flora.
 Setæ sparse, acute, $\cdot 035 \times \cdot 007$ mm.
 New Zealand.
17. **Hymenochæte imbricatula**, (Schwz.), Lev. Ann. Sci. Nat. (1846),
 v., p. 152.
 Setæ robust, obtuse, $\cdot 07 \times \cdot 012$ mm.
 United States.
18. **Hymenochæte tenuissima**, B. in Cuban Fungi, No. 418.
 Setæ acute, $\cdot 1 \times \cdot 008\text{--}\cdot 01$ mm.
 Ceylon, Cuba, India, Mexico, United States.
19. **Hymenochæte spadicea**, B. & Br. in Ceylon Fungi, No. 612.
 Setæ delicate, $\cdot 035\text{--}\cdot 04 \times \cdot 005$ mm.
 Ceylon.

* * RESUPINATUS.

20. **Hymenochæte fuliginosa**, (Lev.), Berk. in *Cuban Fungi*, No. 429.
Thelephora ulmicolor, B. & Br.
 Setæ often sparse, $\cdot 035 \times \cdot 006$ mm., occasionally attaining $\cdot 05 \times \cdot 008$ mm.
 Europe, Cuba, Ceylon, Venezuela.
21. **Hymenochæte cinnamomea**, (Fr. ?)
Corticium cinnamomeum, Fekl. Fungi Rhen., No. 2613.
 Setæ fusiform, $\cdot 12 \times \cdot 007\text{--}\cdot 008$ mm.
 Europe.
22. **Hymenochæte corrugata**, Berk. Outl. p. 272.
Corticium corrugatum Fr. Hym., p. 656.
 Setæ rather obtuse, $\cdot 06 \times \cdot 008$ mm.
 Europe, United States.
23. **Hymenochæte Mougeotii**, (Fr.)
Corticium Mougeotii, Fr. Hym., p. 654.
 Setæ acute, $\cdot 06 \times \cdot 008$ mm.
 Europe.
24. **Hymenochæte corticolor**, B. & Br. in *North Am. Fungi*, No. 244.
 Setæ acute, $\cdot 08 \times \cdot 008$ mm.
 United States.
25. **Hymenochæte floridea**, B. & Br. Journ. Linn. Soc., *Ceylon Fungi*, No. 619.
 Setæ acute, numerous, $\cdot 05 \times \cdot 008$ mm.
 Ceylon.
26. **Hymenochæte cervina**, B. & C. in *North Am. Fungi*, No. 243.
 Setæ slender, acute, $\cdot 09 \times \cdot 007$ mm.
 U. States, Cuba.
27. **Hymenochæte dura**, B. & C. in *Cuban Fungi*, No. 422.
 Setæ small, pointed, $\cdot 03 \times \cdot 005$ mm.
 Cuba.
28. **Hymenochæte depallens**, B. & C. in *Ceylon Fungi*, No. 616.
 Setæ sparse $\cdot 1\text{--}\cdot 12 \times \cdot 008$ mm.
 Ceylon.
29. **Hymenochæte epichlora** (B. & C.)
Corticium epichlorum, B. & C. in *North Amer. Fungi*, No. 258.
 Setæ sparse and delicate, $025\text{--}03 \times \cdot 004$ mm.
 United States.
30. **Hymenochæte ambiens**, B. & C. in *Herb. Berkeley*.
 Setæ slender, $\cdot 09 \times \cdot 006\text{--}\cdot 007$ mm.
 New Jersey (U.S.).
31. **Hymenochæte Berkeleyana** (Mont.), Berk.
Stereum Berkeleyanum, Mont. Syll., p. 178.
 Setæ few and brittle, $\cdot 06 \times \cdot 01$ mm.
 Cayenne.
32. **Hymenochæte pellicula**, B. & Br. *Ceylon Fungi*, No. 618.
 Setæ acute, $\cdot 033\text{--}\cdot 05 \times \cdot 004$ mm.
 Ceylon.

33. **Hymenochæte unicolor**, Berk. and Curt. in *Cuban Fungi*, No. 431.
Setæ unusually slender, $\cdot 07 \times \cdot 003$ mm.
Cuba.
34. **Hymenochæte leonina**, B. & C. *Cuban Fungi*, No. 423.
Setæ rather acute, $\cdot 07 \times \cdot 01$ mm.
Cuba.
35. **Hymenochæte crassa** (Lev.) Berk. in *Herb.*
Substance soft and spongy. Setæ clavate, attenuated at the base, $\cdot 13 \times \cdot 013$ mm.
36. **Hymenochæte umbrina**, B. & C. in *Herb.*
Stereum umbrinum, B. & C., N. Amer. *Fungi*, No. 240.
Substance soft and spongy. Setæ clavate, attenuated at the base, $\cdot 04 \times \cdot 01$ mm.
United States.
37. **Hymenochæte fulvella**, B. & C. in *Herb.*
Setæ robust, fasciculate, $\cdot 09 \times \cdot 018$ mm.
Venezuela.
38. **Hymenochæte insularis**, B. & C. in *N. A. Fungi*, No. 245.
Stereum insulare, Berk. in *Herb.*
Setæ subacute, $\cdot 04\text{--}\cdot 05 \times \cdot 008$ mm.
United States.
39. **Hymenochæte rhabarbarina** (Berk.)
Corticium rhabarbarinum, Berk. in *New Zealand Flora*.
Setæ sub-conical, $\cdot 028\text{--}\cdot 03 \times \cdot 008\text{--}009$ mm.
New Zealand.
40. **Hymenochæte Stevensoni**, B. & Br. in *Ann. Nat. Hist.* xv. (1879),
p. 211, No. 1817.
Setæ pallid, $\cdot 03\text{--}\cdot 04 \times \cdot 006$ mm.
Great Britain.

The forms included above as resupinate may also in some instances become reflexed. The sub-division must not therefore be regarded as absolute.

Sub-genus. *VELUTICEPS*, Cke.

Hymenium velvety with coloured flexuous hairs, usually collected in fascicles.

This has an entirely different structure from either *Hymenochæte* or *Peniophora*. The slender flexuous hairs are collected in conical tufts, which grow directly from the substratum of the hymenium, and are persistent; whilst the bodies in *Peniophora* and the setæ in *Hymenochæte* are but slightly attached to the hymenium, and fall out readily when the hymenium is old. We have included these forms as a subgenus, under *Hymenochæte*, although with a preference for considering them worthy of rank as a separate genus, equally with *Hymenochæte* and *Peniophora*.

The smaller section, with the hymenial hairs scattered, approaches nearest to *Hymenochæte*. The larger section, with the hairs in fascicles, represents our idea of the subgenus.

Sect. i. *Hymenial hairs scattered.*1. **Hymenoghæte (Veluticeps) Archeri** (*Berk.*)*Stereum Archeri*, Berk. in Flora of Tasmania.Hairs dense, sub-flexuous, $\cdot 06 \times \cdot 005$ mm.

Tasmania.

2. **Hymenoghæte (Veluticeps) vinosa** (*B.*)*Corticium vinosum*, Berk. in Herb.Hairs acute, sub-flexuous, $\cdot 08 \times \cdot 006$ mm.

Australia.

Sect. ii. *Hymenial hairs in fascicles.*3. **Veluticeps Berkeleyi**, *Cke.**Hymenoghæte veluticeps*, B. & C. in Cuban Fungi, No. 415.Tufts of flexuous brown hairs, about $\cdot 15\text{--}\cdot 2$ mm. high.

Cuba.

4. **Veluticeps hispida** (*B.*), *Cke.**Hymenoghæte hispida*, Berk. in Herb.Tufts of flexuous hairs honey-coloured, about $\cdot 18$ mm. high.5. **Veluticeps setosa** (*B.*), *Cke.**Hymenoghæte setosa*, Berk. in North Amer. Fungi, No. 246.Tufts of flexuous hairs, dark brown, about $\cdot 16\text{--}\cdot 18$ mm. long.

Fascicles of smaller diameter at the base than in preceding species.

United States.

6. **Veluticeps crocicreas** (*B. & Br.*), *Cke.**Hymenoghæte crocicreas*, B. & Br. in Journ Linn. Soc. xiv., p. 615.Fascicles of hairs very short and conical, about $\cdot 05$ mm. long.

Ceylon.

SPECIES EXCLUDED.

Hymenoghæte noxia, Berk. in Herb. Substance wholly fibrous, without setæ. Samoa.*Hymenoghæte agglutinans*, Ellis. No setæ found in any authentic specimens examined. United States.*Hymenoghæte Carteri*, Berk. in Herb. No setæ. Substance spongy. The only specimen is poor, and partly destroyed by insects. Spores oval, amber-coloured, $\cdot 007 \times \cdot 005$ mm. Bombay.*Hymenoghæte leprosa*, Lev. Ann. Sci. Nat. v. (1846), p. 152. In the only authentic specimen, no setæ found. United States.*Hymenoghæte conspurcata*, B. & C. in Herb. No setæ found in the type specimen. Venezuela.*Hymenoghæte frustulosa*, B. & C. in Cuban Fungi, No. 428. No setæ found in authentic specimens. Cuba.*Hymenoghæte siparia*, B. & C. in Cuban Fungi, No. 424. No setæ found in original specimens. Cuba.*Hymenoghæte muscicola*, B. & C. in Cuban Fungi, No. 425. No setæ; probably a resupinate *Thelephora*. Cuba.

Hymenochæte tomentosa, B. & C. in Cuban Fungi, No. 430. No setæ found, only a loose fibrous structure. Cuba.

Hymenochæte ramealis, B. & Br., Ceylon Fungi, No. 611. The type specimens resemble *Hymenochæte* in habit, but are without setæ. Ceylon.

Hymenochæte Ellisii, B. & Cke. in Grevillea = *Corticium* (*coniphora*) *Ellisii* (B. & C.), in Grevillea.

Hymenochæte dendroidea, B. & Br. in Ceylon Fungi, No. 620. = *Thelephora dendroidea*, Cke.

Hymenochæte vibrans, B. & C. in Herb. No setæ = *Stereum vibrans*, B. & C. in Cuban Fungi, No. 404.

Hymenochæte racodium, B. & C. in Herb. No setæ = an effused *Thelephora*. United States.

The following additions should be made to our previous enumeration of the species of *Peniophora*. See "Grevillea," Vol. viii., p. 17.

17. **Peniophora dissita** (*Berk.*)

Stereum dissitum, Berk. N. Amer. Fungi, No. 241.

Metuloids obclavate, obtuse, verrucose, $\cdot 09\text{--}1 \times \cdot 025\text{--}03$ mm. Texas (U.S.)

18. **Peniophora paupercula** (*B. & C.*), *Cke.*

Hymenochæte paupercula, B. & C. Cuban Fungi, No. 426.

Metuloids of hymenium conical, verrucose, hyaline, $\cdot 025\text{--}027 \times \cdot 012$ mm.

Cuba.

19. **Peniophora crustosa**, *Cke. in Grevillea* VIII., p. 56.

Metuloids obclavate, rough, $\cdot 04 \times \cdot 015$ mm.

New Zealand.

DESMIDS NEW TO ENGLAND.—The following species have been found for the first time in England:—

Sphærozasma secedens, *DeBary.* } At Snaresbrook, Essex.

Closterium linea, *Perty.* }

Cosmarium læve, *Rabh.*, var. **septentrionale**. In Holloway, Middlesex.

RAMULARIA CRYPTOSTEGIÆ. *Pim*, nov. sp.—Forming a very delicate snow-white bloom on decaying seeds of *Cryptostegia*, in a stove at Monkstown, Co. Dublin. Threads well developed, simple or slightly branched, spores large, oblong-cylindrical, rounded at the ends, about $\cdot 03\text{--}04 \times \cdot 006\text{--}007$ mm., with one to three very delicate septa, inserted on the extremities of the threads. March, 1880.

GREENWOOD PIM.

HEREFORD FUNGUS FORAY.—The date fixed for this annual fête is Thursday, October 7th. The assembling will, of course, commence as usual on the preceding Monday, October 4th.

FUNGI OF AUSTRALIA.

I. BASIDIOMYCETES, BY C. KALCHBRENNER.

The species, of which the following are descriptions, will be illustrated by plates in a succeeding part of this Journal, when the descriptions will be given of other species in order. The specimens, except where otherwise stated, were communicated by Baron Ferd. Müller, K.M.G.

Agaricus (Collybia) eradicatus, *Kalch. in litt.*

Ag. radicato statura, stipite procero, sulcato, etc., simillimus sed nec radicatus, nec ad basim incrassatus.

On the ground. Richmond River, N. S. W. (M. Hodgkinson).

Agaricus (Mycena) trachycephalus, *Müll. & Kalch.*

Fascicularis. Pileo pisi magnitudine, subglobosi demumve campanulati, papillati, rugoso-striati, umbrini; stipites filiformes, 1-2 pollicares, basi coalito, ibidemque villosi, ceterum glabri, pileo dilutiores; lamellæ adscendentes, subdistantes, simplices, angustæ, helvolæ.

On wood. Mount Macedon. (Müller).

With the habit of *M. cohærens*, but smaller and tougher.

Agaricus (Omphalia) pumilio, *Kalch.*

Pileus membranaceus, convexus, umbilicatus, radiatim striatus, glaber, cervinus; stipes fistulosus, tenuis, breviusculus, curvato-decurrentibus, angustis, subconfertis, pileo pallidior.

On wood. Richmond River, N. S. W. (M. Hodgkinson).

Pileus 3-4 lines broad. Stem 3-5 lines long. Allied to *Ag. rusticus*, Fr.

Agaricus (Pleurotus) lenticula, *Kalch.*

Pusillus, dorso adnatus, orbicularis, planus (1-3 mm. diam.), nudiusculus, olivaceo-fuscescens, vel albido pulverulentus, lamellis linearibus, simplicibus, confertis, in puncto sub-excentrico concurrentibus, olivaceo-fuscis.

Rockhampton. (Müller).

Allied to *Ag. applicatus*, Batsch., with the pileus reflexed and gills lax.

Agaricus (Pleurotus) læticolor, *Kalch.*

Pileus carnosulus, excentricus, convexus, obtusissimus, margine involutus, lævis, glaber, aureus; stipes farctus, æqualis, nudus, cum lamellis emarginato-adnatis, confertis, ventricosus, carneis. (Sporarum color ignotus).

On wood (?) Richmond River, N. S. W.

Pileus 1-1½ cm. broad. Stem equal or longer, 1 mm. thick. Of doubtful affinity.

Agaricus (Pleurotus) luteo-aurantius, *Kalch.*

Pileo carnosulo, orbiculari, convexo, obtuso, lævi, nudo, luteo-aurantio; stipite fistuloso, tenui, brevi, tenaci, curvato-adscendente, lævi, pulverulento, rufo, ad basim bulbillosam albo-floccoso-farinoso; lamellis adnatis, decurrentibus, vix confertis, latiusculis, gilvis. (Sporarum color ignotus).

On wood. Richmond River, N. S. W. (M. Hodgkinson).

Pileus 1 cm. broad. Stem 1-2 cm. high, 1 mm. thick. Rather an aberrant *Pleurotus*, but the pileus is not a good *Collybia*.

Agaricus (*Pleurotus*) *imberbis*, Kalch.

Dimidiato-sessilis, reniformis, membranaceus, horizontalis, convexo-planus, glaber, cum lamellis vix confertis, ramosis, albidus, siccitate rugosulus, alutaceus. Sporæ breviter ovatae (0.007×0.005 mm.)

On wood. Richmond River. (M. Hodgkinson). Dividing Range. (*Berggren*, 419).

Pileus 2-4 lines broad. Near *Ag. limpidus*, Fr.

Agaricus (*Pleurotus*) *abbreviatus*, Kalch.

Totus rufus. Pileus excentricus, convexo-planus, margine involutus, lævis, glaber; stipes diametro pileo brevior, sursum deorsumve leviter incrassatus; lamellæ plano-adnatæ, angustæ, confertæ.

On wood. Richmond River, N. S. W. (M. Hodgkinson).

Pileus 2-3 lines broad. Stem 2 lines long, $\frac{1}{2}$ line thick.

Agaricus (*Inocybe*) *gomphodes*, Kalch.

Pileus carnosulus, campanulatus, vertice gompho-globoso ornatus, fibrillosus, fuscescens; stipes fæctus, subæqualis, basi bulbillosus, ibidemque mycelio albo incrassatus, ceterum rufo-pallidus; lamellæ adscendentes, subliberæ, confertæ, lineares, angustæ, strictæ, griseo-umbrinae.

Richmond River, N. S. W.

Pileus $\frac{3}{4}$ inch high and broad. Stem 2 inches long, $1\frac{1}{2}$ l. thick. The apex of the pileus, occupied by a nodule the size of a pea, is very distinctive.

Agaricus (*Naucoria*) *nasutus*, Kalch.

Pileus tenuis, carnosulus, umbone papillæformi elongato instructus, ad marginem sulcatus, glaber, ochraceus; stipes fistulosus, æqualis, tortuosus, fibrillosus, subferrugineus; lamellæ emarginatæ, denticulo decurrentes, subconfertæ, latæ, ventricosæ, ferrugineæ.

Richmond River, N. S. W.

Pileus $\frac{1}{2}$ inch and more broad. Stem 2 inches long 1 line thick, umbo prominent, becoming reddish.

Coprinus *murinus*, Kalchb.

Pusillus. Pileus submembranaceus, conico-campanulatus (vix 1 cm. altus), vertice papilla eminente instructus, passim floccis albis, sat persistentibus adpersus, vix striatus, griseus; stipes curtus (1-3 cm.) tenuis, sursum leviter attenuatus, altus; lamellæ latiusculæ, nigrae.

Richmond River. (Mücller).

Allied to *C. coopertus*, Fr., but differs in the papillate, opaque, somewhat pulverulent, not micaceous, pileus.

Hygrophorus *scarlatinus*, Kalchb.

Pygmæus. Pileus carnosulus, convexus, obtusissimus ($\frac{1}{2}$ unc. latus), lævis, glaber, margine inflexus, pulchre scarlatinus; stipes cavus (1 cm. long, 1-2 mm. crassus) albo-roseus; lamellæ adnatæ,

subdistantes, crassiusculæ, roseæ. Trama floccoso-granulosa. Sporæ subglobosæ (·003-·004 mm.) glabræ, achroæ.

Rockhampton. (Müeller.)

Marasmius minutissimus, Müell.

Pileus vix seminum *Sinapis* magnitudine, subglobosus, fuscescens. Stipes capillaris, institius (2 lin. altus) ad apicem albo-pulverulentus, ceterum glaber, nigricans. Lamellæ paucae, ob minutiem fungillo vix observandæ.

In ramulis. Richmond River. (Müeller.)

Marasmius pilopus, Kalchb.

E. scorteis. Pileus coriaceo-membranaceus, subdiaphanus, convexus, obtusus, vel centro depressus (vix 1 unc. latus), totus radiatum striatus, gilvo-pallescent. Stipes e faretto-cavus (1-2 unc. longus, 1 lin. et ultra crassus), basi bulbillosus, totus tomento pulveraceo, fulvo-ochraceo, dense vestitus, lamellæ adnatæ, postice latissimæ, ambitum versus sumopere angustatæ, distantes ramosæ, acie integræ, siccando carneo-rufæ, pileo obscuriores. Sporæ ovales minutæ (·0025 × ·0015 mm.).

In lignis. Richmond River. (Müeller.)

This curious species has no immediate allies. It is altogether a peculiar type.

Marasmius crinis-equi, Müeller.

Albido-fulvescens, minimus. Pileo raro, membranaceo, convexo, obtuso (1-2 mm. lato). Stipite (1 cm. et ultra long), setaceo, rigido, atro, nitido, e mycelio atro, equi crinis similari, assurgente, Lamellæ paucae, distantæ, pileo pallidiores.

Surrounding twigs. (Müeller.)

A very curious species. The rhizomorphoid mycelium resembles horsehair, and is profusely developed, whilst the pilei are very seldom produced. The stems rise at right angles from the decumbent mycelium. The only perfect specimens are in the Berkeley Herbarium, Royal Gardens, Kew.

Lentinus fusco-purpureus, Kalchb.

Pileus coriaceus, infundibuliformis, margine reflexo, strigoso hirsutus, fusco-purpureus; stipes elatus, sub-æqualis, dense setulosus, pileo sub-concolor; lamellæ vix confertæ, parce anastomosantes, pileo pallidiores.

Richmond River. (Müeller.)

Pileus 2-2½ in. broad, 3-4 in. high. Allied to *L. Zeyheri*, Berk., but conspicuously different.

Lentinus læviceps, Kalchb.

Pileus carnosus-coriaceus, convexo-planus depressusve, lævis, glaber, albo-flavus; stipes solidus, deorsum attenuatus, basi squamosus, lamellæ decurrentes, crassæ, distantes, acie subintegræ.

Australia. (Müeller, No. 1044.)

Lentinus hyracinus, Kalch.

Sub hoc nomine distinguo fungum in Africa, Australi, primum lectum inter *L. ursinum*, Fr., et *L. castoreum*, Secr. medium, a priore lamellis eximie dentatis ab utroque pileis nec aurito ascen-

dentibus, nec ligulatis diversum. Pileus subsessilis, orbicularis, vel semi-orbicularis, horizontalis, in basim stipitiformem contractus (1-2 cm. longus latusque), postice rugulosus subtomentosus, rufofuscus. Lamellæ latiusculæ, dentatæ, pallidiores.

Richmond River. (Müller.)

Not comparable with *L. vulpinus*, Fr.

Xerotus papuasius, Kalchb.

Subcæspitosus, glaber, alutaceo-ochraceus. Pileo membranaceo-coriaceo, convexo, vertice profunde depresso, margine deflexo, radiatim sulcato; stipite e faretto fistuloso, deorsum leviter incrassato, albo pulverulento; lamellis adnato-decurrentibus, strictis, vix ramosis, integris.

In corticis. Richmond River. (M. Hodgkinson.)

Pileus $\frac{1}{2}$ -1 in. broad, stem 1-2 in. high, 1-2 lines thick. Allied to *X. Rawnaensis*, P. and *X. caribæus*, Plum.

Lenzites torrida, Kalchb.

Tota alba. Pileus compactus, lignosus, dimidiatus, umbonatosessilis, concentrice sulcatus, margine obtusus, subtiliter tomentosus. Lamellæ rigidæ, distantes, dichotomæ, et anastomosantes, acie obtusæ, crenulatæ, vel singulari modo scruposæ.

On wood. Richmond River. (Müller.)

Pileus 2-2 $\frac{1}{2}$ in. broad, $\frac{1}{2}$ in. and more thick.

DACRYMYCES SUCCINEUS, FR., THE EARLY STAGE OF A PEZIZA.

By W. PHILLIPS, F.L.S.

Fries placed *Dacrymyces succineus* in the first instance amongst the Discomycetes as *Calloria succineus* in his *Summa Vegetabilium Scandinaviæ* (p. 359), and adds after his description, "Structuram *P. fusarioides*, Berk. exhibit," but in his *Hymenomycetes Europæi* he removes it to *Dacrymyces*. Herr Fuckel, in his *Symbolæ Mycologicæ* (p. 282), says that he found frequently associated with this translucent amber *Dacrymyces*, similar ones in form of little cups, containing threads filled with globules, which he suspected might be unripe asci. He was not able to distinguish the structure satisfactorily, but he evidently suspected an ascigerous condition of the *Dacrymyces*. The Rev. J. Keith sent me specimens of the *Dacrymyces* from Forres, some time since, which contained the characteristic cylindrical spores only; last year, however, my friend, Mr. C. B. Plowright, while botanising with some of the members of the Cryptogamic Society of Scotland, in the productive woods near Forres in the autumn, found on the decaying pine leaves the most perfect form mentioned by Fuckel in which the sporidia are fully developed. There can hardly be a doubt, on examining the progressive forms associated together on the same pine branch, that the *Dacrymyces* passes into the *Peziza*. It is as obvious an instance of dimorphism as that of *Dacrymyces*

Urticæ and *Peziza fusarioides* B, and rests on similar evidence. The *Peziza* may be thus described—*Peziza electrina*, Ph. and Pl. n.s. Gregarious, minute, subgelatinous, glabrous, amber-coloured, disc concave, marginate; stem rather short, firm; asci narrowly clavate, pointed at the summit; sporidia 8, biseriate, cylindraceo-fusiform, $\cdot 005 \times \cdot 001$. mm.

On decaying leaves of *Pinus sylvestris*, Forres, N.B. intimately associated with *Dacrymyces succineus*, Fr. The cups are $\cdot 1\text{--}\cdot 5$ mm. across, paler on the margin; the stem is generally darker at the base.

NOTICE TO BRYOLOGISTS.—The undersigned takes the liberty of informing all botanists that henceforth, instead of Mr. Limpricht, he is charged with the account of Bryology for the "Botanische Jahresbericht," edited by Dr. Just. Therefore he begs the Bryologists to favour him with transmitting their respective Treatises.

Weilburg (Germany), 1879.

Dr. KIENITZ-GERLOFF.

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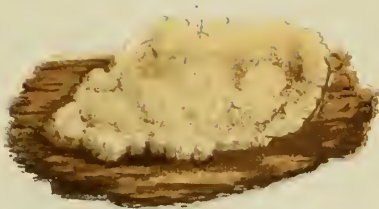
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1.

*P. apressi* B.

2.

*P. disciforme* (Fr.)

3.

*P. aschista* (B & Br.)

4.

*P. Berkeleyi* C.

5.

*P. lilacina* (B&Fr.)

6.

*P. tephra* (B&C)

7.

*P. limitata* (Fr.)

8.

*P. cinerea* (Fr.)

9



10.

*P. papyrina* Jd.*P. Habgallæ* (B&Br.)

11.



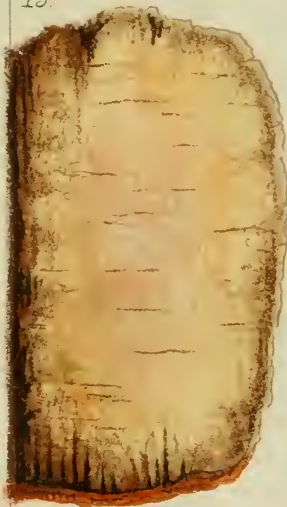
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*P. carnea* (B&Cke)*P. Ravenelii*, C.

18.

*P. quercina* (Fr.)

15.

*P. velutina* (Fr.)

14.

*P. flavido-alba* C.

16.

*P. sparsa* (B&Br.)



1. *Agaricus (Stropharia) Percevalii* B&Br.



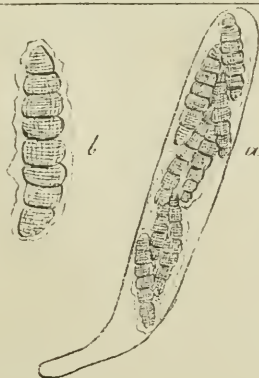
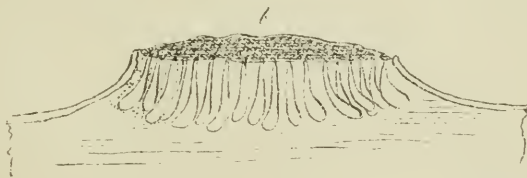
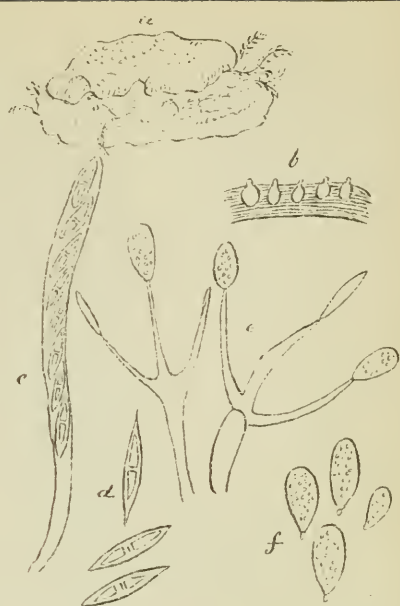


1. *Cort. impennis* Fr 2 *Cort. arenarius* Q. 3 *Cort. Cookei*. Q.



1. *Contolarius obtusus* Fr. var. *gracilis*.

2. *Hygrophorus cossus* Fr.



IV





1. *Hydnum amicum* Q. 2. *Pluteus tenuiculus* Q. 3. *Tuber fulgens* Q.
 3a. *Rhizopogon suavis* Q. 4. *Peziza ampelina* Q. 5. *H. sulfurinum* Q.
 6. *H. stagnale* Q. 7. *Mollisia opalina* Q. 8. *Ascobolus ruber* Q.
 9. *Phialea lilacea* Q. 10. *Lachnella lactea* Q. 11. *Mollisia mitralis* Q.

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